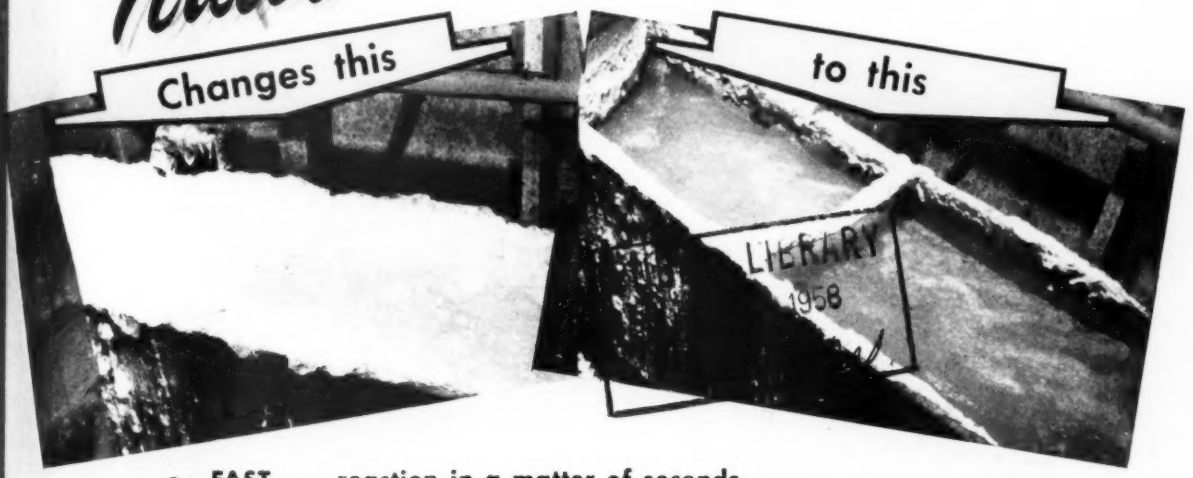
- Optimistic outlook for next decade
- Piping and fittings – available materials
- Hurletron moisture control
- Bauerite process

The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

Nalco 71-B LIQUID ANTIFOAM

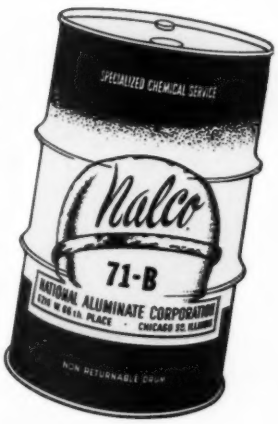


- FAST . . . reaction in a matter of seconds
- EFFECTIVE . . . as a defoamer—as an antifoam
- FAR MORE ECONOMICAL . . . than paste or briquette

Here is what happened when *liquid* Nalco 71-B was tried in a well-known mill plagued with the foaming problem of high-resin pulp.

At a cost of only *one-sixth as much* as the previous antifoam, the mill reported Nalco 71-B *eliminates all foam in seconds!* Sheet quality remains high, and production stoppages and slow-downs due to foaming have been eliminated. Fibre loss to sewers is extremely low and cleaning of cell room and screens has been substantially reduced. Small wonder the mill continues to use Nalco *liquid* 71-B in both primary and secondary pulp screen processes.

There is a whole series of Nalco antifoams designed to get *results* like this in your mill. Ask your Nalco Representative about them, or write direct to Nalco.

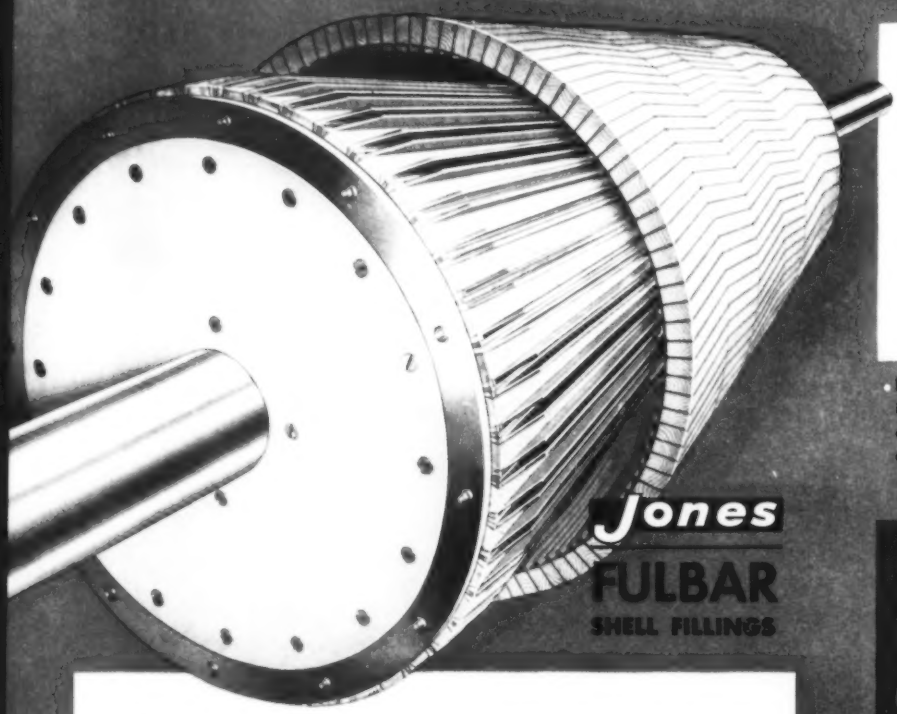


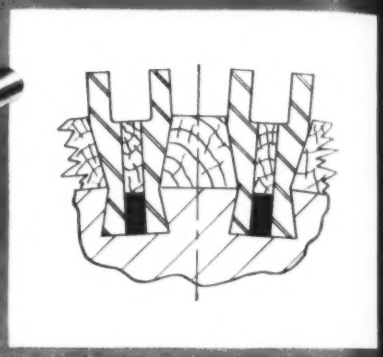
NATIONAL ALUMINATE CORPORATION, 6232 West 66th Place, Chicago 38, Illinois • Telephone: POrtsmouth 7-7240
CANADA: Alchem Limited, Burlington, Ontario
Branches in SPAIN, ITALY and WEST GERMANY

THE Nalco® SYSTEM...Serving the Paper Industry through Practical Applied Science

Ideal Combination for ANY CONICAL REFINER

Jones Adapta-Plug





• Inverted wedge-type slotting of Adapta-Plug is the same for all bars. Fillings can be changed to meet any condition without changing plug.

• Note how one-piece construction of FULBAR Filling makes for ease of handling — cuts installation time, often by hours.

• And rigid, one-piece FULBAR readily compensates for inequalities in shell body of old or worn Jordans that would make precise fitting of sectional fillings a real problem.

Completely bandless, the Jones Adapta-Plug is the strongest, most adaptable, most economical plug ever made. Exclusive with Jones, this revolutionary advance in plug design holds bars more securely in place, reduces slot wear and corrosion, offers maximum adaptability and is amazingly easy to strip and fill. Available in solid plug — or Meehanite sleeve form for easy changeover on old plugs.

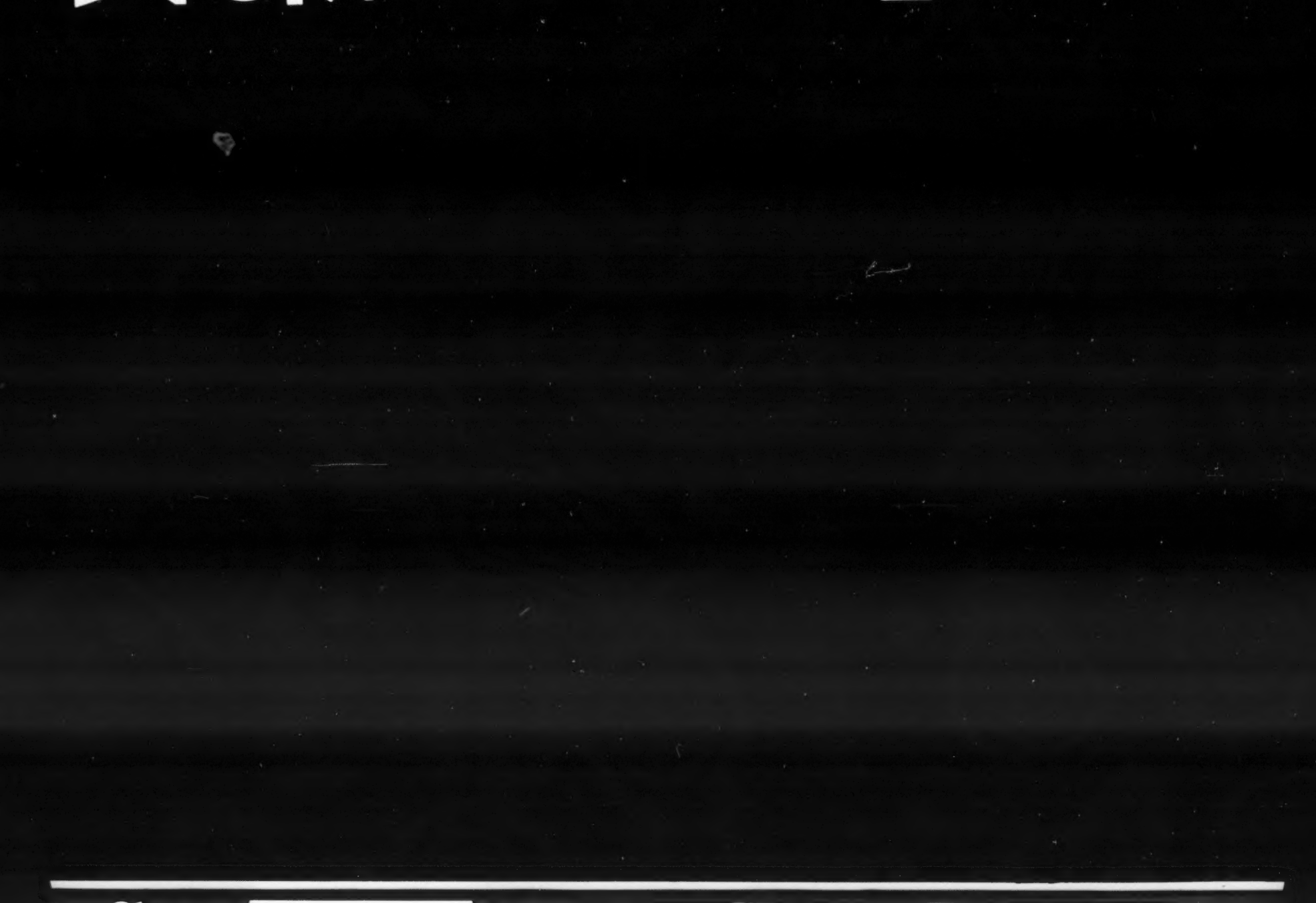
The rigidity and accuracy of Fulbar one-piece shell fillings eliminate keys and wedges, fit shell body of any Jordan, are far simpler to install, easy to grind in — and the patented Nowave pattern offers no sharp ends on bars to form strings or lumps. Over 700 now in use.

Write today for details and names of satisfied users.

E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts
Builders of Quality Stock Preparation Machinery

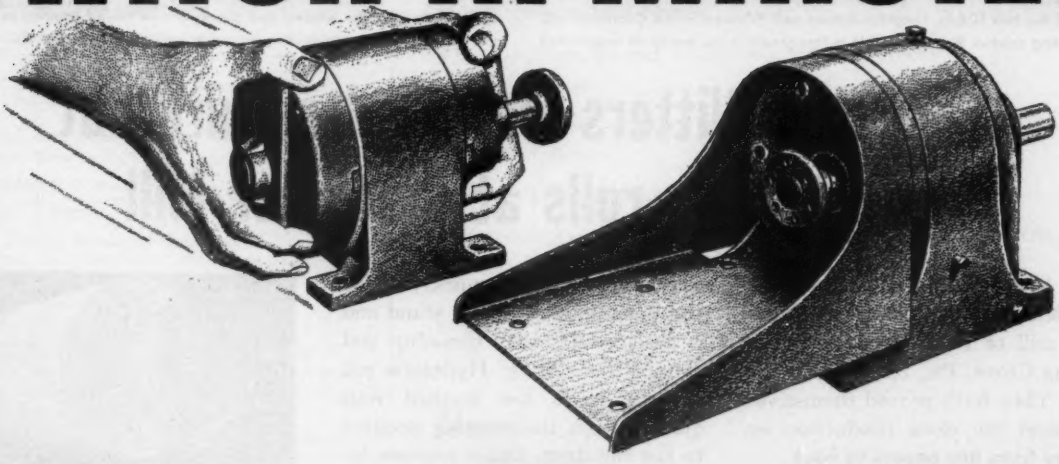
IN CANADA: The Alexander Fleck, Ltd., Ottawa

Export Agents: **CASTLE & OVERTON, INC., New York 20, N. Y.**
Foreign Licensees: **FRANCE Batignolles-Chatillon • SPAIN Gabilondo • ITALY de Bartolomeis • JAPAN Mitsubishi •**



With a LINK-BELT Motogear—you can

PICK A MOTOR ANY ENCLOSURE SWITCH IN MINUTES



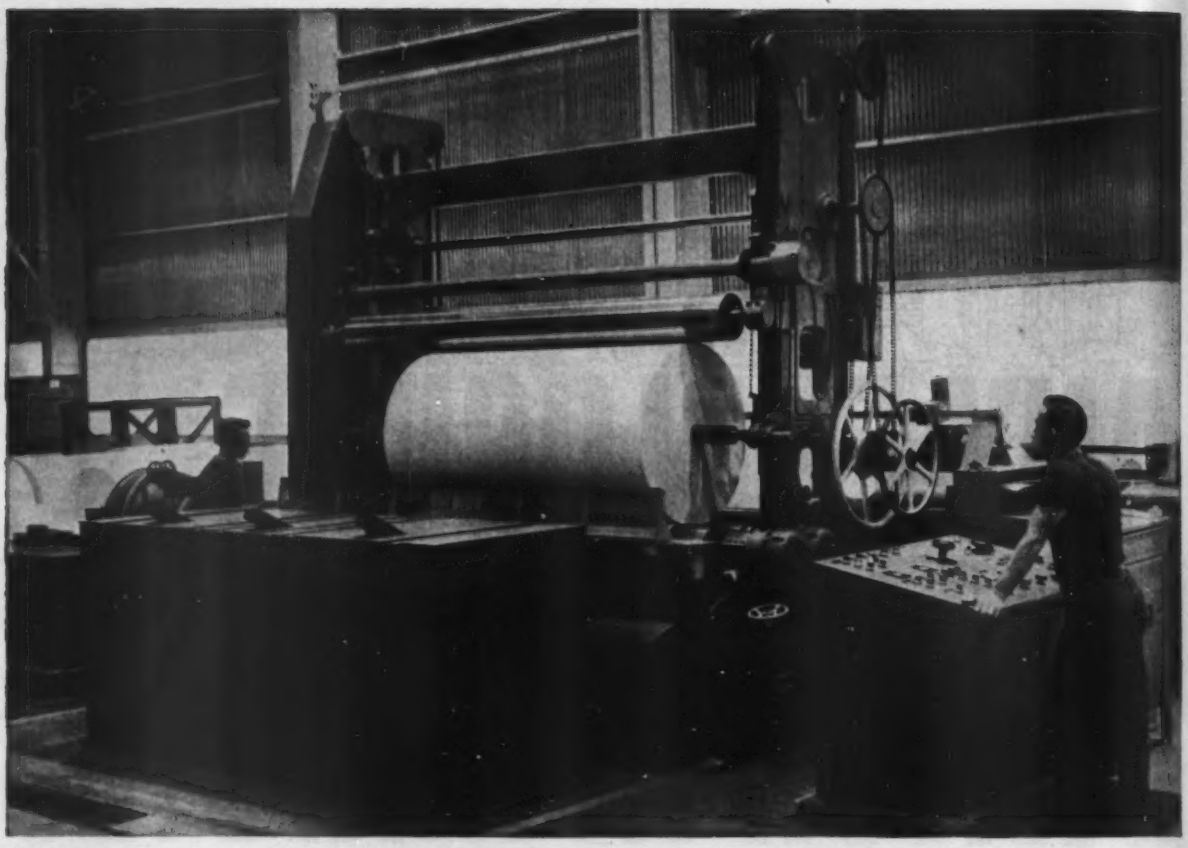
DESIGNED for bracket-mounting foot-type motors of *any* manufacturer, Link-Belt Motogears radically slash delays in making motor replacements. Remove four bolts, disengage the coupling, re-assemble with another motor —and it's ready for work. No need to drain oil. And no re-alignment problems — the bracket assures accurate positioning of the motor.

Link-Belt Motogears are immediately available from nearby stocks, in sizes to 100 hp, output speeds from 280 down to 1.8 rpm. Call your Link-Belt office or authorized stock-carrying distributor.

ASK FOR BOOK 2447 — contains features and data on Link-Belt Motogears. Also covers Gearmotors — with flange-mounted NEMA motors—and Electrofluid Motogears with *"Cushion Action."*

LINK-BELT

SPEED REDUCERS



One of the two 104-in. Langston Slitters and Winders in the Glatfelter mill completing rewind. Roll drop table in foreground is up, ready to receive roll when ejected by the winder, and chocks are in raised position to stop the roll. Note console incorporating all major indicators and controls.

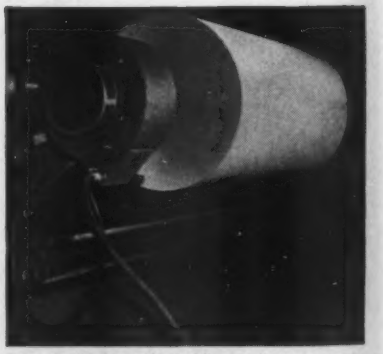
Langston Slitters and Winders turn out tight, even rolls at Glatfelter Mill

Two 104-in. Langston Slitters and Winders have been working in the new mill of P. H. Glatfelter Co., Spring Grove, Pa., for more than a year. They have proved themselves in round the clock production on grades from fine papers to book.

One of the most important features, according to the company, is the constant tension unwind control on the Langston Shaftless Roll Stand, which keeps the tension constant throughout the winding operation. Perfect rolls can be turned out from 9 to 100-lb. stock in roll widths from 7½ to 104 in.

The equipment can be quickly loaded and lined up on the back stand and is designed for easy threadup and gang slitter setting. Hydraulic roll ejectors move the finished rolls quickly from the winding position to the roll drop. Other features include shearcut slitters to eliminate dust; many interlocked controls for extra safety; automatic edge guide control to allow precision trim rewinding of narrow and salvage rolls.

Find out how Langston Slitters and Rewinders can benefit you. Write SAMUEL M. LANGSTON Co., 6th & Jefferson Sts., Camden 4, N.J.



Langston Shaftless Unwind Stand eliminates back-breaking, time-consuming task of hoisting heavy shafts into place. Hydraulically operated arms reach out, pick up the roll, and raise it into running position—a 1-man, pushbutton operation.

LANGSTON leadership...by design

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 40 **NUMBER 2** **MAY 1958**

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1889-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

Editorial Director
A. W. J. DYCK, Ph.D.

News Editor
D. W. ZEIGLER

Market Analyst
JEROME KASSIDAY

Advertising and Production Manager
CHARLES E. DOWD

Circulation Manager
JOHN H. REARDON

Assistant Circulation Manager
AUDREY CUSTER

Advertising Representatives:

CHICAGO 5: **Jack Henderson,** 431 South Dearborn Street, Wabash 2-3543

CLEVELAND 13: **Rodney W. Cramer,** 1231 Main Ave., MAin 1-9357

EASTERN: **Jack Bain Company,** 545 Fifth Avenue, New York 17, N.Y. Murray Hill 2-3345

SOUTHEASTERN: **Fred W. Smith,** 1201 Forest View Lane — Vesthaven, Birmingham 9, Ala., Tremont 1-5762

WEST COAST: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Ryan 1-9155

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950 issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence to:
Fritz Publications, Inc.
431 South Dearborn Street
Chicago 5, Illinois

BPA

Member: Business Publications Audit of Circulation Inc.

Accepted as controlled circulation publication at Mendota, Ill.

Subscription rates: United States, U. S. Possessions and Canada $3.00 for one year. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

Features . . .

Editorial — Plan new large-scale expansions now 77

Whither? — Air-photo techniques insure more efficient and economical logging road location — Trends in logging operations — Paper with a 13-per cent stretch — Flint hospital endorses paper service for food — Maintenance should be upgraded 142

The use of pipe, fittings, valves and pumps in the pulp and paper industry — Part I 86
by Roland L. Allen Jr.

Optimistic future for paper in the next decade 89
by A. Kenneth Beggs

Monel netting cuts insulation maintenance costs 91

Hurletron moisture control 92

The chemi-mechanical (Bauerite) pulping process 94
by LeRoy Bauer

Soil mechanics — a tool in plant site selection 97
by B. S. Persons

Nekoosa-Edwards tackles insect loss in pulpwood 107

$4,000,000 Rayonier woodmill on stream at Grays Harbor Div. 108

Plans call for merger of Standard Packaging and Eastern Corp. 108

Oxford Paper purchases Champion-International 111

News . . .

News of the Industry 107
Names in the News 117
Necrology 121

Departments . . .

Current Comments 103
Coming Events 114
Foreign Abstracts 122
Patent Reviews 124
New Products 127
New Literature 135
Market Quotations 139
Index to Advertisers 141

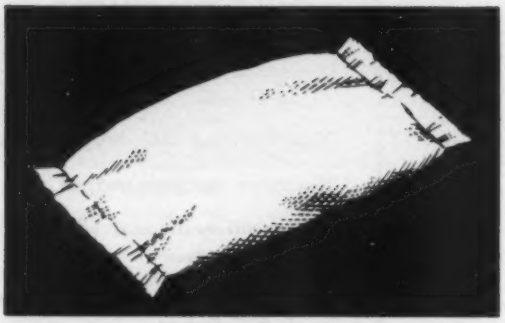
The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

© 1958 by Fritz Publications, Inc.

VANZYME®

SOL-PAKS

Starch Liquefying Enzyme
in water soluble packets



Accurately pre-weighed quantities
of standardized Vanzyme powder
to convert starches
for tub and calender sizing, machine
coating and laminating adhesives.

R. T. VANDERBILT CO., Inc.

230 PARK AVENUE · NEW YORK 17, N. Y.

From our point of view..

Plan new, large-scale expansions now

While it may seem somewhat incongruous to direct attention to industrial expansion at a time when the industry considers itself plagued by the results of a slight over-expansion, the fact still remains that the pulp and paper industry is due in the near future for another period of large-scale expansion. The pulp and paper industry has been one of the most dynamic growth industries in the United States. The versatile nature of its product is ample assurance that this industry will continue to be a growth industry for an indefinite length of time.

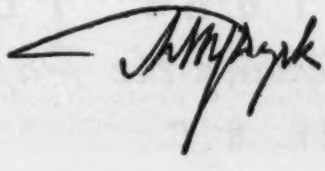
How far-reaching and imminent the next expansion activity promises to be becomes apparent from the latest projection figures in an article by A. Kenneth Beggs in this issue showing U. S. paper and pulp consumption by 1965 and 1970. The latest study made by Beggs (author of the Weyerhaeuser Report) predicts a paper and board consumption of 49 million tons and a pulp consumption of 33 million tons in the U.S. by 1965. This amounts to an increase of 40 per cent over the 1957 consumption of these products.

As startling as these figures are, it is difficult not to accept them as a reasonably accurate estimate of this country's future requirements, especially in view of the fact that a number of important recent studies showing future pulp and paper requirements had to be revised upward in the light of the ever-increasing rate of paper consumption.

To meet the anticipated requirements new and vastly expanded production facilities will be put into operation during the next decade. The time for planning these expansions is now, because the capital expenditure involved and the size and high cost of the individual units of equipment for pulp and paper making are such that a mill cannot afford too many errors once the actual stage of construction and machinery installation is reached.

This is also the time for equipment manufacturers to keep their communication lines open. The pulp and paper manufacturer may not be aware of the latest improvements made on a certain piece of equipment, he may not be aware of the high level of performance and economy of operation of a newly develped unit of equipment, or he may not appreciate the advantages of the low maintenance of another. The time to keep him informed of these things is now. Once the expansion is underway, it may be too late. The mill may already have made its final selection or formed sufficient prejudice in favor of a certain line of equipment to the exclusion of another that might have served it better.

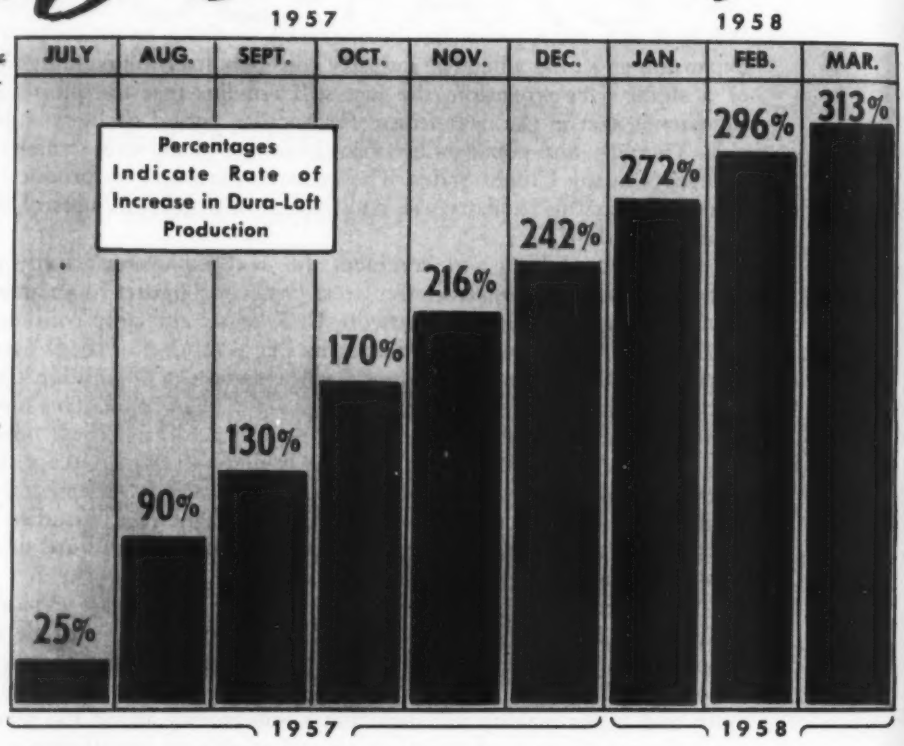
The time to think, to plan and to communicate is now if you want to participate in and reap the maximum advantage from the new and large-scale expansion the pulp and paper industry will experience within the next decade.



Dura-Loft Production

Zooms!

to meet enthusiastic reception by papermakers, nationwide



TENAX
Dura-Loft Felt

Since Dura-Loft's introduction less than one year ago, experimental orders have been followed by firm re-orders, at a rapidly increasing rate. Dura-Loft has proved itself on position after position.

The difference you can **see and feel** in a Dura-Loft Felt shows up in superior performance, greater operating efficiency.

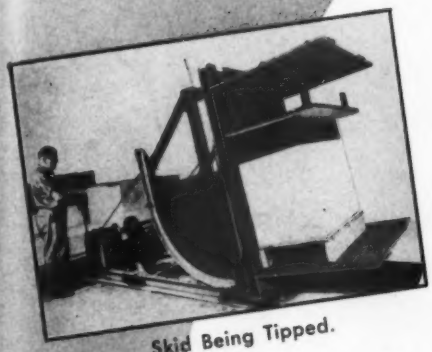
Get the facts on Dura-Loft now.

LOCKPORT FELT COMPANY, INC.

Serving the Paper Makers Since 1891

NEWFANE, N.Y. STARKVILLE, MISS.

The Southworth SKID-TURNER



Skid Being Tipped.

Skid Being Turned.

Turned Skid Being Lowered.

TURNS 6000 lbs. OF ANY MATERIAL IN LESS THAN 3 MINUTES

- One Man Operated—Does the Work of 8 Men
- Push-Button Operated With Complete Control of Skid.
- Precise Control of Squeeze.
- No Hand Clamps or Tying Devices Needed.
- Will Not Damage Sensitive Stock.
- No Heavy Lifting Necessary.
- Capacity: up to 52" x 76" x 80" high Skids—6,000 lbs. in weight.

HERE'S PROOF OF SAVINGS

One firm using a Southworth Skid-Turner over 5 years reports: "The lapsed time to get a load from any point in our plant, turn it, and deliver is only 15 minutes. We turn about 125 loads per week. By hand, this would take 250 hours weekly or 12,500 hours per year. The Skid-Turner required only 1,812 hours last year. Other economies are the reduction in damaged merchandise due to 'handling wrinkles' and in the jogging required when loads are hand turned." (name on request)

CUT OPERATING COSTS AND INCREASE PROFITS WITH A SOUTHWORTH SKID TURNER

Write, call, or wire today. Our representatives will be glad to give you complete details.

SOUTHWORTH MACHINE CO.

QUALITY MACHINES SINCE 1890

38 WARREN AVENUE PORTLAND, MAINE

SOUTHWORTH ALSO MANUFACTURES Automatic Skid Lifts ● Paper Conditioners ● Humidifiers ● Punching Machines ● Envelope Presses ● Corner Cutters ● Punch Heads ● Lift Tables ● Designs - Builds Custom Equip.

FROM DESIGN — to Fabrication and Erection

CB&I offers complete 4 point DIGESTER SERVICE

Profit from pulp takes more than a mill and men to run it. The same will be true of the next digester you buy.

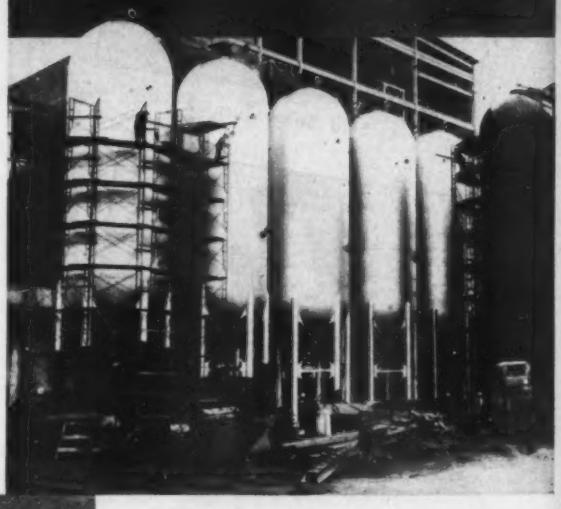
That's why CB&I offers a complete and expertly coordinated 4 point digester *service*. Our facilities to (1) design, (2) engineer, (3) fabricate and (4) erect are duplicated by few, if any other, sources.

Complete stress-relieving facilities are maintained at each CB&I plant. And CB&I crews are fully equipped and experienced for field stress-relieving. Partial or full X-ray and magnetic particle examination of structures in shop or field is available to meet all code or customer requirements.

Hortonclad®, CB&I's exclusive, vacuum bonding process can provide digester cladding of integral, continuous bond having exceptional strength and corrosion resistance.

These are but a *few* of the reasons why CB&I digesters and pulp plant equipment are selected for the most rigid requirements. And, why CB&I services offer an exceptionally high degree of quality control between shop and field. A bulletin on *CB&I Pulp and Paper Structures* and our *Field Services* bulletin will provide more details. Write our nearest office for your copies.

PP-25



Top left: 40-ft. long digester designed for working pressure of 150 lbs. per sq. in. leaves our Birmingham plant where it was X-rayed and stress-relieved.

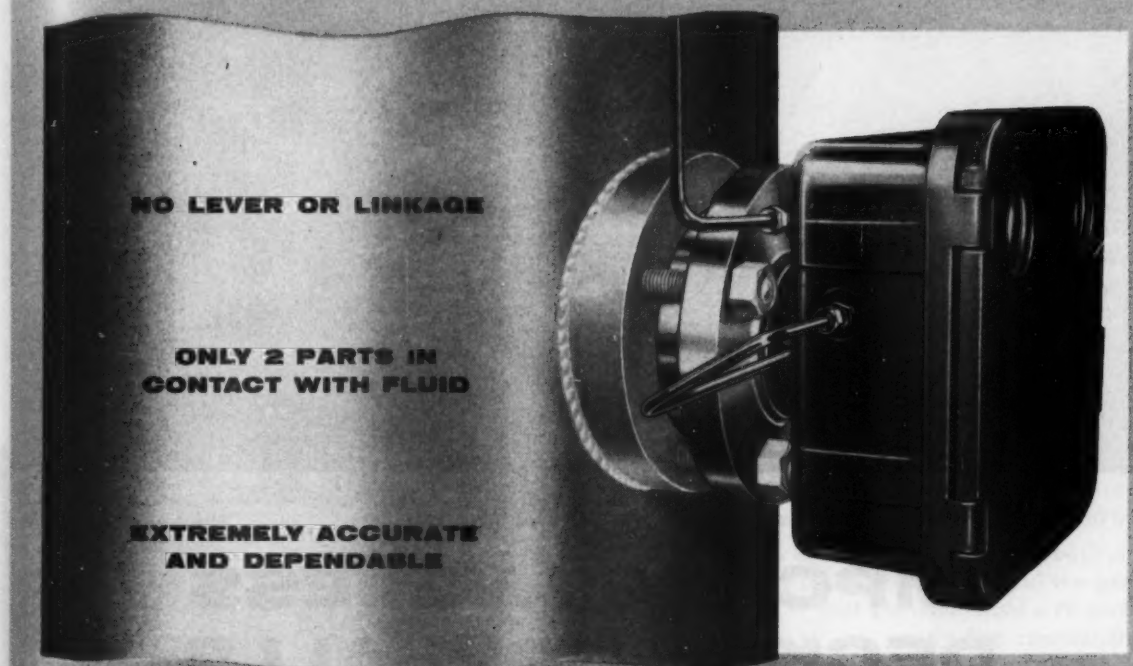
Middle: Digester leaves CB&I stress-relieving furnace at our Birmingham plant. Furnace can handle vessels up to 13-ft. diam. by 79-ft. long in one heat.

Below: 60-ft. high digesters erected, stress-relieved and seam welds X-rayed in the field by CB&I at Weyerhauser's 400-ton sulphite pulp mill at Cosmopolis, Washington.

Chicago Bridge & Iron Company

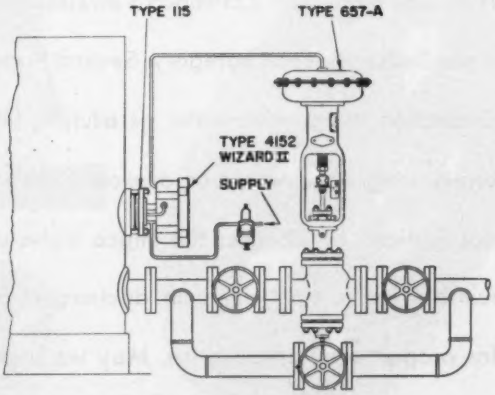
Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • South Pasadena • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, GREENVILLE, PA. and NEW CASTLE, DEL.

For that hard-to-handle liquid... consider the "115" Transmitter



Ideal as a liquid level transmitter for slurries, paper stock, and viscous or corrosive fluids

Flange mounts direct to side of tank. Only the diaphragm and the diaphragm ring come in contact with the fluid. Diaphragm is Teflon impregnated glass cloth ... ring can be stainless steel or some other corrosion resistant material of your choice. Pneumatic output of the "115" is a 1 to 1 measure of the liquid head in the vessel. Frequently supplied with the popular Fisher Wizard II as the controller which makes a complete and compact assembly for liquid level control application. Also used as a transmitter for remote, level indicating, recording or controlling. Primarily for open tank service, the "115" is used in pipe lines and vessels with pressures up to 75 psi. For complete information on the Fisher "115" write for Bulletin F-115.



Fisher "115" with the Wizard II as the controller on a liquid level control installation.

IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD ... CHANCES ARE IT'S CONTROLLED BY

FISHER GOVERNOR COMPANY

Marshalltown, Iowa / Woodstock, Ontario / London, England

CONTINENTAL EQUIPMENT CO. DIVISION, Coraopolis, Pennsylvania

FISHER®

SINCE 1880

Photo courtesy of St. Regis Paper Co., Jacksonville, Florida. 11'-6" x 20' Valveless Decker Saveall operating with new "Seminole Chief" Kraft Board Machine.

IMPCO VALVELESS DECKER-SAVEALLS

There are more than 235 Impco Valveless installations. Many of these fall in the Decker-Saveall category. Several handle the entire paper machine production, using white water as dilution. Some act as broke thickeners, again using white water as dilution. Others are in a variety of saveall applications. In all cases the Impco Valveless delivers clarified effluent suitable for re-use, with pulp discharged at a controllable consistency for proper stock preparation. May we show you how this versatile machine can reduce your costs and simplify your operating procedure?

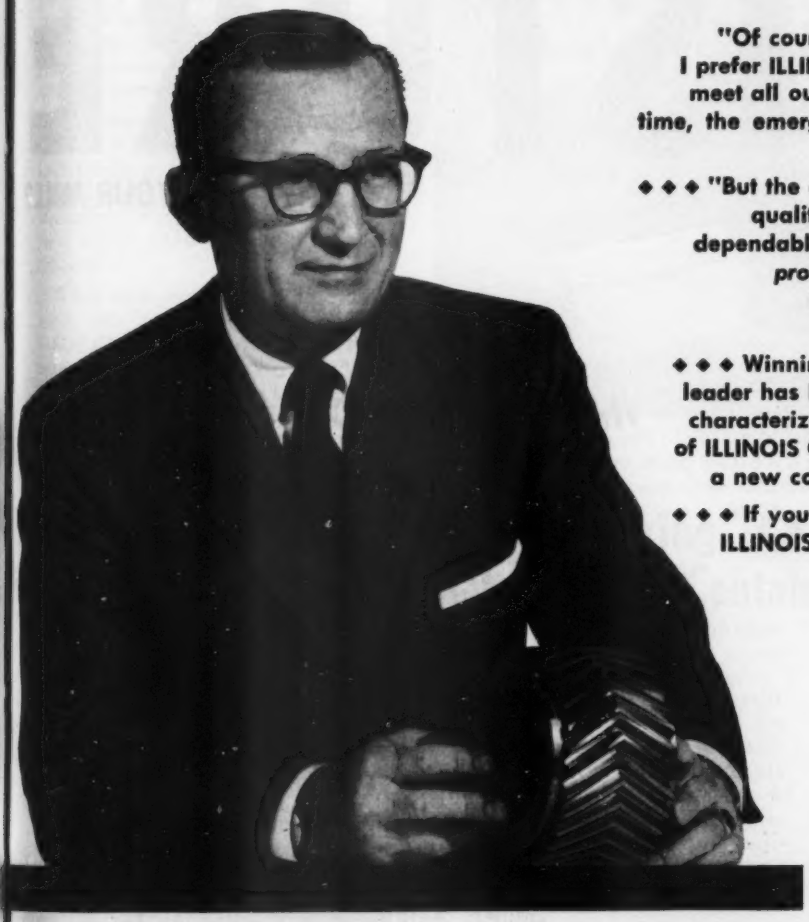
IMPCO®

IMPROVED MACHINERY INC.
NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec

WHY BUY ILLINOIS GEARS?

THE ANSWER IS QUALITY... EVERYTIME!

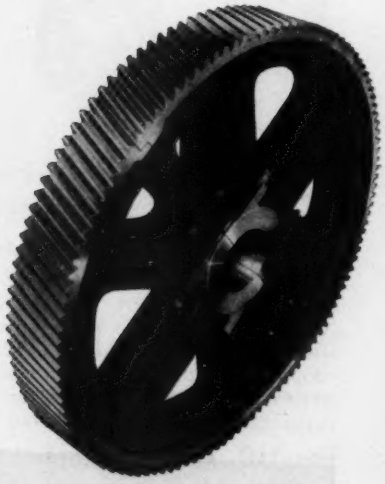


"Of course, there are many reasons why I prefer ILLINOIS GEARS. I like the way they meet all our specs, the way they deliver on time, the emergency service we get when we need it—to mention a few.

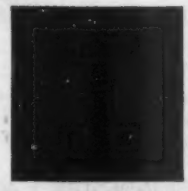
◆ ◆ ◆ "But the one thing I like most of all is the quality of ILLINOIS GEARS—enduring, dependable quality I can trust because it is *proven by performance . . .* one more reason why we feel they are our most economical buy."

◆ ◆ ◆ Winning this recognition as the quality leader has been rightfully earned because it characterizes every step in the manufacture of ILLINOIS GEARS—a creed that established a new concept of quality in gear making.

◆ ◆ ◆ If you are not now using or specifying ILLINOIS GEARS find out about the gears that are *made right with quality as the first consideration.*



Look for this mark ILL® *the symbol on finer gears*



ILLINOIS GEAR & MACHINE COMPANY

2108 NORTH NATCHEZ AVENUE • CHICAGO 35, ILLINOIS

HOW
IMPORTANT IS

MOISTURE

CONTROL IN YOUR MILL?

the HURLETRON AUTOMATIC MOISTURE CONTROL measures sheet moistures to plus or minus .1 of one percent

. . . and at the same time, the Hurletron fidelity of measurement is not affected by changes in caliper, weight, furnish, pH, speed, tension, additives, and coatings. Achieve the same success that major paper mills are presently experiencing with the Hurletron Moisture Control . . . write to Electric Eye Equipment Co., today.

HURLETRON Electric Eye Equipment Company

1930 EAST FAIRCHILD STREET, DANVILLE, ILLINOIS

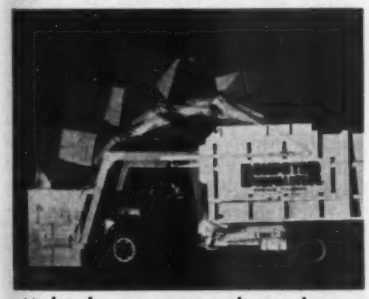
New Invention Cuts Waste Disposal Costs By Two-Thirds for Volume Paper Producers

Industry Cost Averages May Be Lowered Soon

If your plant is average, you're probably spending between .55 and .85 cents for every cubic yard of waste or trash moved to the disposal area . . . not including truck operation costs.

A recent development, the DEMPSTER-DUMPMASTER self-loading packer, promises to cut direct disposal costs to a new industry low of .07 to .16 cents per cubic yard for volume producers.

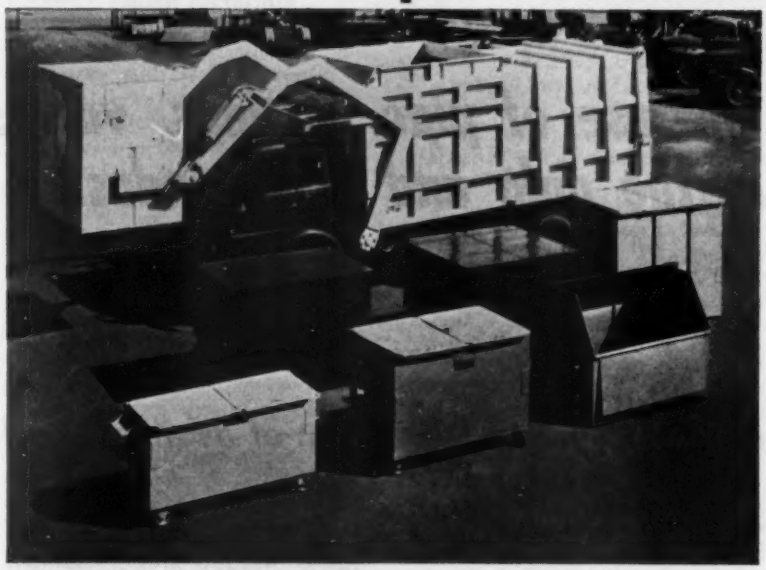
This new approach is an extension of the widely-established DEMPSTER-DUMPSTER System, in that it employs detachable waste storage containers. However, instead of carrying each container to the disposal area for dumping, the new machine empties many containers into its body, where the material is compacted to a fraction of its former volume. This permits per-trip payloads of 50 to 100 cubic yards of loose material, depending on its characteristics.



Multiple exposure photo shows dumping of 6 cu. yd. container.

How it Operates

The one-man Dumpmaster makes its rounds from container to container. Approaching, the driver engages lifting channels on the container's sides with the clearance arms. From controls in the cab, or remote controls at the front bumper, the container is lifted and rotated, discharging waste into the packer body. The material is hydraulically compacted while enroute to the next location. Containers may also be handled from docks or below grade. The safety clearance arms never pass the cab windows, eliminating possibility of driver injury.



The newly developed DEMPSTER-DUMPMASTER is shown with the seven basic containers it serves. Being hoisted is a 6 cu. yd. model. On ground are 1, 2, 3, 4 and 5 cu. yd. designs. Open container is used for hand-loading service.

New "Tracking" Caster Developments Make Plant "Container Trains" Practical

To whip the high cost of moving refuse outside, many plants are going to "container trains." Using special casters and couplers, eight to ten containers are towed by "plant mules" to inside generation points where an empty is dropped off and the full one is coupled on. Outside, the containers are uncoupled and automatically emptied by the waiting DUMPMASTER.

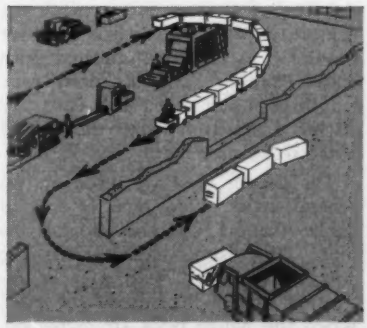


Diagram shows containers, in train, being hauled outside for emptying.

* * *

Many Designs Available

Standard and special-purpose containers, ranging from one through six cubic yard capacity, with or without casters, are available. The two cubic yard container above holds the equivalent of over 12 30-gallon trash cans.

Cost-Finding Book Offered

Write for the free 40-page book, "How to Cut Waste Disposal Costs," offered by the manufacturer. It contains cost-finding formulas, solutions to problems, case histories, industry average costs, etc. Equipment demonstrations arranged on request.

Mfd. by Dempster Brothers, Inc.

DEMPSTER BROTHERS

KNOXVILLE, TENN., DEPT. PI-5

Feature articles

The use of pipe, fittings, valves and pumps in the pulp and paper industry

ROLAND L. ALLEN JR.
Vice President, Eastern Engineering Co.

Part I (Contd.)—Discussion of available materials: pipe and fittings

▶ Part I in this issue discusses such materials as asbestos cement, spiral welded steel, titanium, Hastelloy, nickel, saran, rubber, polyvinyl chloride, wood, aluminum, copper and brass, and polyethylene.

Asbestos cement pipe and asbestos cement-lined fittings

Asbestos cement pipe has been used in the pulp and paper industry for service above and below ground. The underground service is usually for water distribution, while the overhead service has been in the various process systems where this piping material has been found to be satisfactory.

In underground service cast iron fittings are used. These may be bell and spigot or mechanical joint type fittings. On the spigot end of the fittings the rubber-ring-in-groove seal of the same design as the coupling used for joining pipe sections may be utilized. In service above ground cast iron flanged fittings, fabricated stainless steel flanged fittings and asbestos cement-lined carbon steel flanged fittings have been used. The asbestos cement-lined carbon steel fittings offer the feature of a continuous asbestos cement internal surface in the piping system. It should be pointed out that the fitting material to be used with asbestos cement pipe must be selected with the service conditions in mind.

Where cast iron and carbon steel fittings have been used, they have been installed with and without internal linings or coatings. Where linings or coatings have been used they have been in the forms of chemical resistant paints, sprayed plastic compounds and such linings as rubber and plastic.

The asbestos cement-lined carbon steel flanged fitting is a mitred fitting made from sections of steel jacketed transite pipe. The steel jacket is welded, and the internal asbestos cement joint is sealed with a suitable cement.

Below ground the asbestos cement pipe is always joined with an asbestos cement coupling sleeve containing two rubber rings that provide water tightness and also relieve the line of stresses and provide for flexibility and resilience. Above ground it is rigidly connected with bolted flanges. The standard pipe length is 13 ft., and the ends are machined to accommodate the type of flange to be used.

The flanges used are made in two general types. One type is a split flange that is clamped around the pipe. This flange requires that the pipe be machined with a taper increasing toward the end of the pipe. When the flange bolts are tightened, the flange is forced against the taper and is thereby held in place. The other type is a single-piece flange that is attached to the pipe with a sulfur-base compound. For this flange the pipe end is grooved. This type of flange has grooves or a recession in the internal diameter. These grooves in the flange, the space between the flange and the pipe and the grooves in the pipe are filled with sulfur-base compound. After this solidifies, the flange is held rigidly to the pipe.

For both types of flanges the gasket surface is actually the ends of the pipe, and the wall thickness of asbestos cement pipe is great enough to give a satisfactory gasket surface. Since the pipe ends are the gasket surfaces, the pipe must project beyond the face of the flange. The design of both types of flange, obviously, gives an uninterrupted asbestos cement surface except for the inside face of the gasket.

Asbestos cement pipe is made in Classes 100, 150 and 200. Any of these classes may be used for underground service according to the working pressure required. Class 150 is the manufacturers' recommended standard for all overhead service, and it is the author's opinion that this recommendation should be adhered to. However, Class 100 has been used for overhead service, but its use should be limited to very low pressure service and where no shock is anticipated.

Since asbestos cement is a relatively brittle material, in overhead service it

must be adequately supported and braced to eliminate sway, bending movements or sagging, and any offset or bend in the pipe run must be braced in such a manner as to absorb the shock of water hammer. Recommendations on the support and bracing of this pipe can be obtained from the manufacturer.

An initial linear expansion due to wetting takes place when the line is put into service. Thereafter the thermal expansion in long runs must be absorbed in expansion joints. Three different kinds of expansion joints have been used with asbestos cement pipe. They are a slip-sleeve type similar to the coupling used on underground installations, on asbestos cement-lined steel flanged slip type and on corrugated rubber or metal type. Where expansion joints are used, extra guiding of the piping on each side of the joint is required, and the pipe must be anchored at each end with sufficient rigidity to withstand the end thrusts caused by the internal pressure of the fluid handled.

Spiral welded steel pipe and fittings

Another available piping material is spiral welded steel pipe and fittings. This material has been used extensively in pulp and paper mill piping systems for many years. It is made from carbon steel sheet or strip that is spirally wrapped around a mandrel with the spiral seam welded to make pipe. After the pipe is made, it is used "as is ", or it can be hot-dip galvanized. Spiral welded steel pipe is also made in a variety of stainless steel alloys.

Spiral welded steel pipe is made in sizes from 4 in. through 48 in. in wall thicknesses from 1/16 in. through 11/64 in. (No. 16 through No. 8 U. S. standard gage) in accordance with ASTM A211. The spiral weld is made by the electric fusion welded (arc) process and may be spiral lap joint, spiral lock seam joint or spiral butt welded joint.

Spiral welded pipe may be obtained with several different types of ends to accommodate various methods of coupling sections of pipe, or the pipe may be butt welded.

Fittings of the same wall thicknesses as the pipe are obtainable. They are generally of mitre welded construction. Lightweight flanges of forged, rolled and plate types are also available.

Where galvanized construction is used, the pipe should be fabricated to the desired configuration before hot-dip galvanizing, or if welding is done in the field one of the various galvanizing materials available for spot regalvanizing should be used to restore the galvanized finish that is destroyed by welding.

Titanium piping materials

Titanium piping materials are used only in very minute quantities in pulp and paper mills but are worthy of mention due to the fact that they provide an excellent solution to some few problems. This material has outstanding corrosion resistance but is extremely expensive.

Titanium pipe and tubing is made in a limited range of sizes, but almost anything needed can be made from titanium sheet.

Since titanium is so expensive and since the methods of handling, forming and welding titanium are not generally known, it is recommended that where it is used the piping be purchased completely fabricated and ready for erection from a specialist in titanium fabrication.

Hastelloy pipe and fittings

Hastelloy is the trademark for a series of nickel base alloys produced by Haynes Stellite Co. Hastelloy is made in four grades (B, C, D & E) and is available in cast and wrought pipe and fittings.

These alloys are comparatively expensive but are economical to use in the more severe corrosive services. Although the other three Hastelloy alloys are used in pulp and paper mills, the Hastelloy alloy "C" is probably the most used. Its analysis is as follows:

Chromium	-	15.5 - 17.5%
Carbon	-	0.15% max.
Molybdenum	-	16 - 18%
Silicon	-	1% max.
Manganese	-	1% max.
Iron	-	4.5 - 7%
Tungsten	-	3.75 - 4.75%
Phosphorous	-	0.04% max.
Sulfur	-	0.03% max.
Nickel	-	Balance

This alloy is available in sheet form and can be welded by a variety of welding processes such as atomic hydrogen, metallic-arc, oxy-acetylene and inert gas shielded arc; so pipe, of the thin wall type used in pulp and paper mills, can readily be fabricated.

The Hastelloy alloy "D" is available in cast form only. It is nickel-silicon alloy with a silicon content of 8.5 to 10 per cent and has excellent abrasion resistance properties. Hastelloy "D" can be welded by the oxy-acetylene process.

Nickel pipe and fittings

Nickel pipe and fittings are available in schedule 10 and standard and extra-strong wall thicknesses in sizes from 1/2 in. through 12 in., and thin wall pipe and fittings can be fabricated from sheet for larger sizes.

Nickel pipe is manufactured in accordance with ASTM B 161. Plate is manufactured in accordance with ASTM B 162 and forgings in accordance with ASTM B 160.

Although not used extensively in pulp and paper mills, nickel is an excellent material for use in hot concentrated caustic service. Nickel is readily fabricated and welded.

In addition to nickel piping, two high-nickel alloys are used. These are Monel, a nickel-copper alloy, and Inconel, a nickel-chromium-iron alloy. Both are readily fabricated and welded.

Saran-lined steel pipe and fittings

Saran-lined steel pipe and fittings are available in 1-in., 1¼-in., 1½-in., 2-in., 2½-in., 3-in., 4-in., and 6-in. nominal pipe sizes. It is made by inserting the saran liner in an oversize steel tube and swaging the steel tube down to standard iron pipe outside diameter. This swaging operation locks the saran liner to the steel casing.

Saran-lined steel pipe is made by Dow Chemical Co. and distributed by Saran Lined Pipe Co.

Three kinds of saran-lined fittings are available. The first is a saran-lined malleable iron union fitting that is made in 1-in., 1¼-in., 1½-in. and 2-in. sizes. This type of fitting is available in union, union 90° ELL, union 45° ELL, union tee and union cap styles.

The second kind of fitting available is a saran-lined cast iron flanged fitting that is made in 1-in., 1¼-in., 1½-in., 2-in., 2½-in., 3-in., 4-in., 6-in. and 8-in. sizes. This type of fitting is available in 90° ELL, 45° ELL, tee, reducing tee, concentric taper reducer, eccentric taper reducer, cross and lateral styles.

The third kind of fitting available is a saran-lined cast steel flanged fitting that is made in the same sizes and styles as the saran-lined cast iron flanged fitting.

Also available is a line of cast iron and forged steel companion, blind and reducing flanges.

For most services in pulp and paper mills the cast iron saran-lined flanged fittings will be satisfactory and cost less than the saran-lined cast steel flanged fittings.

All saran-lined pipe and fittings must be installed using methods prescribed by the manufacturer. If these methods are used, this piping will give excellent service. It has been the

author's experience that in actual practice the flanged fittings give more assurance of a trouble free installation than do the union type fittings available in sizes 2 in. and smaller. However, there are many installations using union type fittings that are giving excellent service. It can probably be said that closer adherence to the manufacturer's recommendations is required for union type fittings than for flanged fittings.

Saran-lined pipe and fittings should not be subjected to any welding operations, and saran-lined pipe should not be bent.

Rubber-lined steel pipe and fittings

Any of the carbon steel pipe and fittings previously mentioned may be obtained with a rubber lining. The carbon steel casing should be sufficiently thick to withstand the service pressure and to provide adequate rigidity to protect the rubber lining. Standard weight carbon steel pipe and fittings or the heavier gages of spiral welded steel pipe and fittings are usually adequate for pulp and paper mill service.

The rubber lining may be obtained in soft, semi-hard and hard rubber types and should be compounded to give the properties required for the particular service.

For best results the steel pipe should be prefabricated in flanged sections that are of a size and shape that are convenient for rubber lining. It is necessary that all sharp edges be ground off to a smooth and gentle radius before rubber lining. It is generally more convenient to have the rubber lining vendor supply and fabricate the steel piping as well as apply the rubber lining. The rubber lining should be bonded to the steel piping.

Rubber-lined pipe and fittings should not be subjected to any welding operations after the lining is in place.

The rubber lining should be electrostatically tested to detect pin holes.

Polyvinyl chloride-covered steel pipe and fittings

As with rubber-lined steel pipe and fittings, any of the types of carbon steel piping materials may have a corrosion-resisting covering of polyvinyl chloride plastic. This material is applied by dipping the whole piece in a liquid bath of plastic. Since the application is a dipping operation, the entire surface inside and out is coated. After curing, a homogeneous coating is obtained that is bonded to the pipe.

This type of construction makes it mandatory that the steel pipe and fittings be prefabricated in their final form before coating.

After coating, that portion of the surface that is to be subjected to the corrosive condition should be electrostatically tested to detect pin holes.

Absolutely no welding can be done on the pipe after coating, and care should be used in handling the pipe so that the coating will not be damaged.

Wood-lined steel pipe and fittings

Wood-lined steel pipe and fittings are obtainable with white pine, Douglas fir and redwood linings in sizes from 4 in. inside diameter to approximately 30 in. inside diameter. The wood lining ranges in thickness from about ¾ in. in the 4-in. size to about 1½ in. in the 30-in. size. The casing is of light gage steel but will withstand working pressures of 200 psig for 4-in., 5-in. and 6-in. sizes, 150 psig for the 8-in. size, 125 psig for the 10-in. size and 100 psig for sizes 12 in., 14 in., 16 in., 18 in., 20 in., 22 in., 24 in., 26 in., 28 in. and 30 in.

Standard wood-lined fittings are 90° ELLS, 45° ELLS, tees, crosses, 45° laterals and concentric reducers. Special fittings can be made to order.

All of the fittings are flanged, and the pipe must have flanged ends. Pipe may be sawed to any desired length, and flanges may be welded on without damage to the wood lining.

The steel casing may be painted or hot-dip galvanized, or an asphalt coating may be obtained. The wood lining is of tongue and groove construction. The pipe is made in standard 10-ft. and 20-ft. lengths.

Aluminum pipe and fittings

Aluminum pipe is made in accordance with ASTM B241 and ASTM B274 in sizes from ⅛ in. through 12 in. and in wall thicknesses in accordance with ASA schedules 5, 10, 40 (standard) and 80 (extra strong). Larger sizes of pipe may be made from aluminum plate or sheet of any thickness.

Aluminum welding fittings are made in sizes through 16 in. and in some cases through 24 in. and to the same over-all dimensions as carbon steel fittings.

Aluminum is very easy to fabricate. It can be formed into practically any shape with very little power. The welding of aluminum piping materials is very simple with inert gas shielded welding methods. Aluminum may be cast with a number of different cutting tools. Among these is the common hand saw with about 8 teeth per inch.

Aluminum piping materials have not been used extensively in pulp and paper mills up to this time, but the use of this material will probably increase in the future.

Copper and brass pipe and fittings

Copper and brass pipe has been used in varying amounts in pulp and paper mills for a number of years. It is made in a wide variety of pipe and tube sizes through 16 in. Copper and brass pipe is seldom used in pulp and paper mills in sizes above 3 in. or 4 in. Above these sizes copper or brass tube is normally used.

Copper water tube in sizes ¼ in. through 12 in. is made in types K, L and M in accordance with ASTM B88. The actual outside diameter is ⅛-in. larger than the size designation (i.e., 12-in. copper water tube is 12⅛-in. O. D.). Type K tubing has a heavy wall thickness, type L has a medium wall thickness and type M has a light wall thickness.

Copper pipe is made in sizes ⅛ in. through 12 in. to standard ASA dimensions for steel pipe and in regular and extra strong weights in accordance with ASTM B42. Red brass pipe is made in the same sizes and weights as copper pipe and in accordance with ASTM B43.

Copper pipe and tubing cannot be readily welded, although several welding methods have been developed that allow the welding of copper. The most satisfactory method of joining copper is by soldering. Various types of solder materials may be used, depending upon the strength required. Silver solder gives about the strongest soldered joint and is easy to use.

Fittings and flanges are available in copper and brass and are made in wrought and cast forms. Brass or bronze screwed fittings are made in accordance with ASA B16.15 for 125-lb. class and ASA B16.17 for 250-lb. class. Both are made in accordance with ASTM B62. The 125-lb. class is made in sizes ⅛ in. through 4 in., and the 250-lb. class is made in sizes ¼ in. through 4 in.

Cast brass solder joint fittings are made to fit ASTM B88 copper water tube and are made in accordance with ASA B16.18 and ASTM B 62. These fittings are made in sizes ¼ in. through 8 in.

Cast brass or bronze flanges and flanged fittings are made in 150-lb. and 300-lb. classes in accordance with ASA B16.24 and ASTM B61 and ASTM B62. These fittings are made in ½-in. through 12-in. sizes.

Wrought copper and wrought bronze solder joint fittings are made

(Continued on page 99)

Optimistic future for paper in the next decade*

A. KENNETH BEGGS**
Manager of Industry-Wide Research
Stanford Research Institute

Domestic consumption of paper and board in 1965 and 1970 is expected to reach 49 and 58 million tons respectively; pulp consumption is expected to rise to 33 and 39 million tons respectively.

WHILE NEW PULP, paper and board capacity has been added at an exceedingly high rate over the past decade, this new capacity—along with the old—has enjoyed high rates of utilization. For example, the rate of capacity utilization in the paper and board segment of the industry has fallen below 90 per cent in only a single year in the past decade. The paper and board segment of the industry has operated at an average rate of utilization of about 93 per cent for the decade as a whole. This average includes the past year of 1957, in which the ratio fell to about 91 per cent. This 1957 rate of utilization is a far cry from the average ratio for the 1929-1947 period of about 80 per cent, and still further from the less than 75-per cent ratio that, on the average, characterized the depression years.

The wood pulp capacity of the industry has also enjoyed a high rate of utilization. In spite of the continuing competition of Canadian and Scandanavian pulps, the domestic capacity has operated at an average rate of utilization of about 89 per cent in the postwar period. This, too, is a rate that is a far cry from the less than 80 per-cent average rate that characterized the 1929-1947 period, and even farther from the less than 70-per cent rate that existed during the depression years of the 1930s.

Thus, the pulp, paper and board industry has enjoyed an almost ever-increasing demand for its products in the postwar period. Accordingly, the industry continued to expand its productive capacity, and with good reasons. In the first place, the increased production could not have been obtained without substantial increases in capacity. New capacity was required both to offset obsolescence in old capacity as well as to provide needed increments in total capacity. Secondly, most producers have been quite aware that unless they individually expanded their abilities to compete for markets, other producers would certainly do so. The risk of investing in new plant and equipment at a rate a bit higher than each producer would prefer if the choice had been his alone to make probably has been far less than the risk of losing markets to those producers who chose to expand; markets once lost are not easily regained.

So, in spite of loud moanings that the industry is overexpanded, I do not believe that the postwar expansion of the industry's capacity has been either irrational or unwarranted. Nor do I think that the spectre of overcapacity has returned to haunt the industry and paint it with red ink for a long time to come. A pessimistic view of the industry can be taken only if one assumes either that our national economy, for some unknown reason, is going to fall apart at the seams, or that paper and board are going to be replaced in substantial measure by other materials. To contend that either of these assumptions is realistic is, in my view, sheer nonsense.

Our economy over the next decade

The rate of future consumption of paper and board in the United States over the coming decade will depend on many factors. Principal among these will be (1) the rate of growth in population of the United States, (2) the rate of increase in the purchasing power of that population and (3) the rate at which prices and quality of paper and board increase relative to those of other materials that typically compete with paper and board in their many and varied uses.

The problem posed, then, is what may we reasonably expect with respect to growth in population and changes in the level of economic activity in the United States over the coming decade or so, as indicators of what we may reasonably expect with respect to the future consumption of pulp, paper and board over the same period.

In projecting our economy out for the next decade or so, we are of course bypassing that currently popular indoor sport of guessing as to when and how shall we pull out of the current dip in business activity. Suffice it to say here that the current dip is a timely reminder that while the path of our economy is assuredly upward we must never assume that periodic dips in our economy are wholly a thing of the past. At the same time, the steam that is being generated in high places for policies to stem the downward spiral of business activity is very heartening; it indicates we are prepared to pull out all stops in using our built-in stabilizers to prevent a really serious depression. Any projection of our econ-

*Abridged from an address entitled, "The Role of Western United States in Pulp and Paper Production in the Coming Decade", presented at the American Chemical Society national meeting, San Francisco, April 14, 1958.

**Author of "America's Demand for Wood, 1929-1975" (Weyerhaeuser Report) and "The Future for Paper in the United States".

omy must necessarily be based upon the expectation of short-term upward and downward swings, with the swings tempered in each direction by policies of government, industry, labor and agriculture that will reflect the responsibility of each for insuring our long-term continued growth on sound economic bases.

Expected paper and board consumption by 1965 and 1970

Based on continuing studies at Stanford Research Institute, we expect that by 1965 our national population will gain another 13 per cent over its 1957 level, reaching a population in 1965 of nearly 191 million and by 1970 a population of about 205 million. We estimate, further, that by 1965 this population will have an income, as a measure of economic activity, about 25 per cent greater than it was in 1957, and that by 1970 economic activity will be close to 18 per cent higher than in 1965. This is tantamount to saying that we expect the level of business activity about 12 years hence to be about 50 per cent higher than it was during the past year.

Based on these projections, and the things that they imply, we estimate that paper and board consumption in the United States by 1965 will be about 49,000,000 tons, an increase of about 40 per cent over consumption in 1957. By 1970 we expect this consumption to rise to about 58,000,000 tons, an increase of about 66 per cent over 1957. On these data, we expect the consumption of paper and board to increase about 2,000,000 tons more over the next seven years than it has in the past 10 years, and to increase in the next 12 years as much as it has in the whole period from 1929 to 1957.

Contentions against this optimistic outlook are invalid

Against this optimistic outlook it might be contended that paper and board consumption in the past was partially accounted for by relatively low prices and use-cost, and that future projections must not assume that the same price relationship between paper and board and their competing materials will continue in the future as in the past, particularly in view of the decreasing availability of timber resources for meeting all the wood requirements in the nation. It might also be contended, in opposition to such an optimistic projection, that much of the increase in past consumption of paper and board has resulted from these materials displacing other materials in end-product uses, and that it cannot be expected that paper and board can continue to displace other materials at past rates.

Actually, neither of these contentions are valid objections to an optimistic outlook for growth in consumption of paper and board over the coming decade. With respect to the first contention, consideration of the factors that will tend to influence the future supply of paper and board — and particularly the factor of wood supply — leads us to the conclusion that there does not appear to be any bar to the industry's supplying paper and board in the future at prices no higher relative to the general level of prices or relative to the prices of competing materials than in the past. The production of paper and board increased during the past at a faster rate than did their prices, and in spite of the fact that their prices increased at a rate somewhat faster than those of all commodities in the economy taken together. Moreover, production of paper and board has increased faster in relation to their price increases than did, for example, lumber, a material that competes with paper and board for both raw materials and important end-product markets.

With respect to the second contention, paper and board have displaced competing materials in many uses through time, but these displacements have not occurred at one full swoop; rather, the process of shifting to and from the use of paper and board in end-product manufacture has been a continuous process. The past relationships between the growth in consumption of paper and board and the changes in the size and activity of the national economy have built into them this continuous process of shifting material use to and from paper and board. This process of shifting the materials base of manufactured products goes on daily and will continue to do so.

Paper (other than writing and printing paper) and board do not have the whole material market in any of their principal uses; there are many new uses to which they can and will probably be adapted depending upon relative economies of their use, changes in technology, rate of development of new products and changes in the availability of other materials. Moreover, as the consumption of new and old products in which paper and board are used increases, so will the consumption of paper and board; and the increases in consumption of these end-products will tend to change with changes in the size and activity of the national economy. There is no reason to conclude that the consumption of paper and board in the future will be any less because of fewer uses remaining in which displacement can take place. The growth in consumption of end-products in which they are already used are probably of more importance to their total consumption than are the incremental number of end-uses in which they can, and will, displace other materials.

Imports and domestic production

Although it is expected that paper and board consumption in the United States will increase by about 14,000,000 tons by 1965 and by about 23,000,000 tons by 1970, it does not follow that these increases will be wholly met by United States production. A significant portion of this future consumption will be met by net imports of paper and board from foreign countries, particularly Canada.

The United States has been consistently self-sufficient to a large extent in all paper and board with the exception of newsprint. Our newsprint imports, principally from Canada, have constituted over 95 per cent of our paper and board imports.

It is unlikely that imports of paper and board other than newsprint will become significantly large as a result of either lower relative prices of foreign supplies, taking into account the tariff situation, or the inability or unwillingness of domestic producers to increase production capacity. It is expected, however, that Canada will continue to be the principal supplier of newsprint for the United States, since, although the paper machines of the United States industry could physically produce the required quantity of newsprint, the use of these machines to produce enough newsprint to preclude Canadian imports would, at the relative prices of newsprint, decrease the profitability of machine use.

On balance, we exepect that the net imports of paper and board into the United States, will increase in tonnage from nearly 5,000,000 tons in 1957 to nearly 7,000,000 tons in 1965 and to over 8 million tons in 1970.

Deducting these net imports from our projected consumption of paper and board means that we expect that in 1965 there will be about 42,000,000 tons, and in 1970 about 50,000,000 tons, of paper and board produced by the domestic industry.

These expected levels of production of paper and board by the United States industry indicate an increase in domestic production of about 37 per cent between 1957 and 1965, and of about 19 per cent between 1965 and 1970. The gap between present pro-

(Continued on page 99)

Monel insulation netting on outdoor steam lines has a long life and eliminates costly erection of scaffolding.

Monel netting is installed on boilers and steam lines of International Paper mill at Mobile, Ala.

Monel netting cuts insulation maintenance costs

▶ Monel netting lasts at least 2½ times as long as conventional galvanized steel wire netting and reduces annual maintenance costs by 50 per cent and more.

THE EXTENSIVE USE of Monel* nickel-copper alloy netting for main steam lines, high-temperature duct work and boiler casing insulation has headed off difficult maintenance problems in the recent expansion of power plant facilities at the Mobile, Ala. mill of the Southern Kraft Div. of International Paper Co. The mill is located in a highly corrosive industrial and salt water atmosphere near the Gulf of Mexico. The specific corrosion problems center around fumes generated by the cooking and bleaching processes.

This corrosion- and heat-resistant nickel-copper alloy wire netting has successfully resisted moisture, heat, acid, alkalis and the sulfate fumes since it was installed in the first portion of this power plant in November 1956. The wire netting is a tight, lasting, rugged fastening device. Therefore, no repairs or replacements have been necessary.

When this Monel insulation netting is used on outdoor power plants, where boilers, ductwork, steam lines and practically all other equipment are exposed to a corrosive industrial atmosphere and all weather conditions, it lasts at least 2½ times as long as the conventional galvanized steel wire netting, reducing the annual insulation maintenance costs by 50 per cent and more.

Actually, it is the high cost of scaffolding erection and dismantling necessary for repairs and re-insulation that constitutes the main cost of insulation maintenance of boilers and steam equipment at industrial power plants. Thus the long-life Monel netting usually pays its extra cost many times over by eliminating a single costly scaffolding job. The first Monel insulation netting job was installed 12 years ago on a petroleum cracking tower, which is exposed to a highly corrosive industrial atmosphere. It is still intact and has required no maintenance.

The netting used is three-twist 1-in. hex mesh and is fabricated from 0.028-in. Monel wire by Gilbert & Bennett Mfg. Co., Georgetown, Conn. Because of Monel's higher strength, it is as strong in 0.028-in. diameter wire as the galvanized steel wire is in a diameter of 0.035 in.

The Monel hex mesh is available in 4-ft. by 300-ft. rolls. A total of 117,600 sq. ft. was used at the Mobile mill installation.

*Registered trademark, International Nickel Co. Inc.

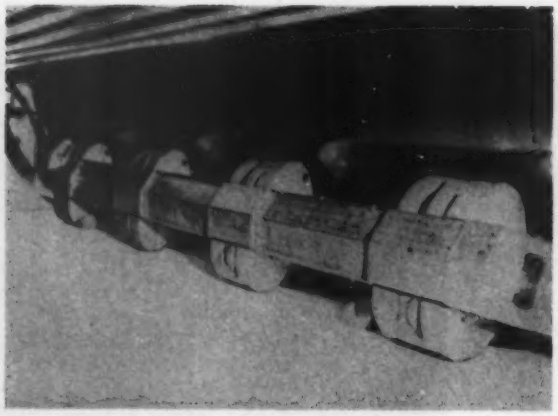


Fig. 1—Thermocouples, faced with stainless steel wear strips, measure the temperature drop after the sheet parts from a fixed-temperature dryer.

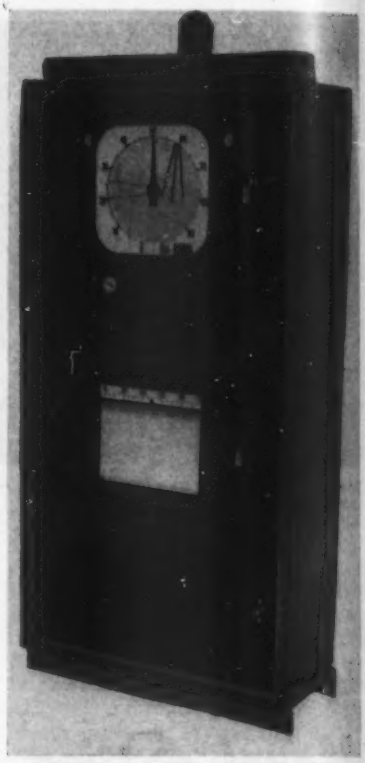


Fig. 2—Instrument indicates and records sheet profile variations.

Hurletron moisture control

▶ The Hurletron control system—now operating in 56 mills—introduces a new concept of effective moisture measurement and control.

THE HURLETRON MOISTURE control system originally developed in Europe by Schie and Straatveit measures the temperature drop after the sheet parts from a fixed-temperature dryer (Fig. 1). This temperature drop is proportional to the moisture content of the sheet through a range from 2 to 15 per cent. Self-generated signals from the thermocouples are fed into appropriate instruments (Fig. 2) for indicating and recording profile variations, and controlling dryer temperature. As a result of this control, moistures are held within plus or minus 0.25 per cent. The system cuts down waste at start-ups and grade changes and makes it possible to run closer to desired specifications.

When used on fourdrinier machines, the instrument scale is calibrated for direct reading in per cent moisture. When applied to cylinder machines making a vast number of grades that have different finishes, a 0 — 1 uniformly-graduated scale is supplied. Each order, although having different amounts of water added in calender water boxes, has been found to require the same set point to produce identical final moisture contents. At a grade change on boxboard the index is moved to the new setting (acquired by observing a previous run), and the indication of moisture helps the operator make the change in minimum time. Production is then controlled precisely at that level.

How the gauging heads operate

The Hurletron automatic moisture control system is normally supplied with multiple gauging locations across the sheet (the total number of units is determined by sheet width and desired spacing). The gauges record on a multi-point instrument to provide profile data on moistures at various locations. The gauges are mounted to permit enough movement to scan the entire sheet for narrow wet streaks. Operators can adjust the wet end to correct profile variations. One gauge, recording the highest moisture, is selected at the control cabinet by pushbutton to record full time on the circular chart of the pneumatic controller. Continuous control of the drying process reduces machine direction variations. In Fig. 3, for instance, gauging head 3 indicates that the machine is running a dry streak at that position, while the remaining heads indicate a uniform moisture condition. Fig. 4 shows a moisture gauge and reference dryer. These sensing heads are withdrawn into a sturdy protective housing at a sheet break by an automatic retraction motor. Note that a doctor blade is included to maintain a clean surface on the reference dryer and to direct the sheet away at breaks.

Actual 24-hour operation

The Hurletron automatic moisture control system installed in a paper mill was in operation for two months when the charts shown in Fig. 5 were made. The left hand chart was recorded during a 24-hour period during a "blind run". Note the extreme variations when the face of the Hurletron control cabinet was covered and operators controlled moisture by previous sampling methods at frequent intervals. In the same mill during a 24-hour period under auto-

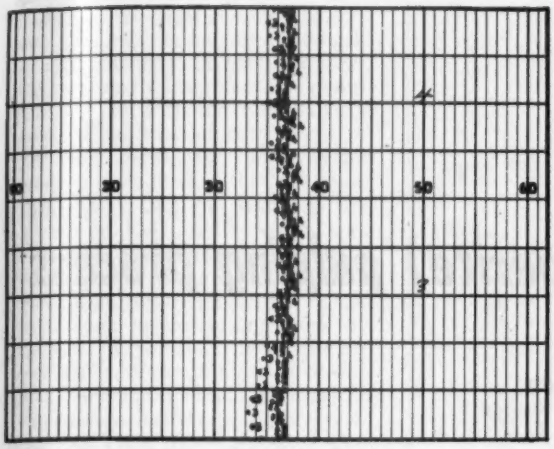


Fig. 3—Gauging head in No. 3 position indicates that machine is running a dry streak in that position.

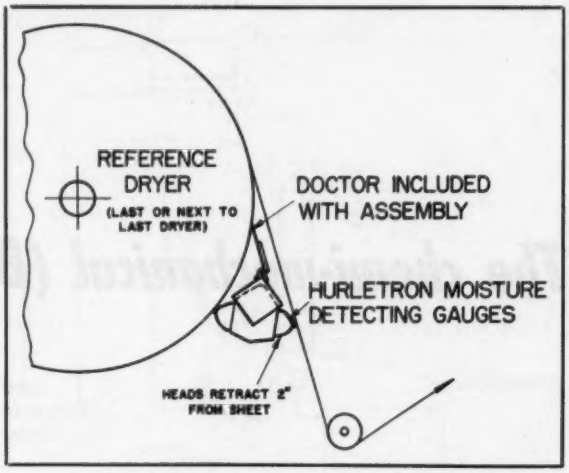


Fig. 4—Moisture gauge and reference dryer.

matic operation the right hand chart was recorded. Although there were two order changes, note the small amount of deviation on the chart.

General description

Each moisture content gauge consists of two thermocouple heads faced with wear strips 3/16 in. thick, 1 in. wide and 4 in. long. One strip made of copper rides lightly on the surface of one of the last dryer cylinders. This dryer is kept at a constant temperature to produce a standard of reference for the system (Fig. 6). As the sheet passes over the dryer its fibers are heated by conduction and radiation to bring the temperature to 212° F. The second thermocouple faced with a stainless steel wear strip is mounted to ride lightly on the sheet 30 in. from the line of separation. When the sheet parts from the cylinder, vapors leaving the fibers cause surface cooling; the temperature of a sheet having 15-

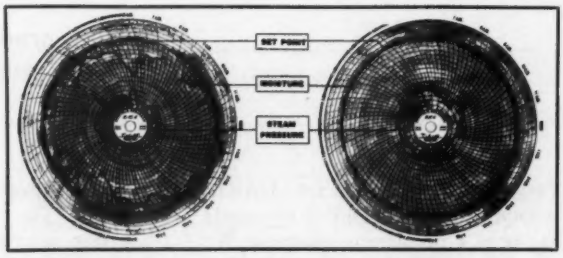


Fig. 5—Left: blind run; right: automatic operation with Hurletron control.

per cent moisture content can drop as much as 75°F in the first 30 in., while a sheet containing 2-per cent moisture will show almost no drop (Fig. 7). The two thermocouples are wired in series so that a difference in EMF is read on electrical instruments (Fig. 7). Both thermocouple heads are pivoted to follow sheet flutter or roll eccentricity and are automatically retracted to make threading easy. The life of the thermocouples is practically unlimited; the wear strips can be expected to last six years on high-speed fourdriniers and at least eight years on cylinder machines. No marking is seen on the finest of papers or on the cylinder face.

Response of the system is rapid because heat transfers quickly through the wear strips that protect the thermocouples. The mass of the wear strips serves to restrict the response of thermocouples to each variation in moisture from foot to foot. This is desirable to the control system because of the large time lag between moisture change in the sheet and corrective temperature change in con-

(Continued on page 100)

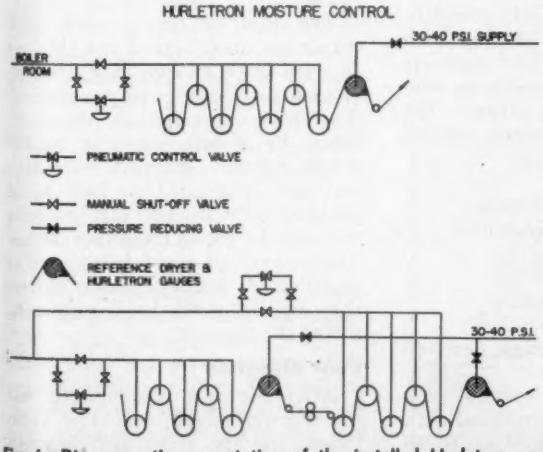


Fig. 6—Diagrammatic presentation of the installed Hurletron control system.

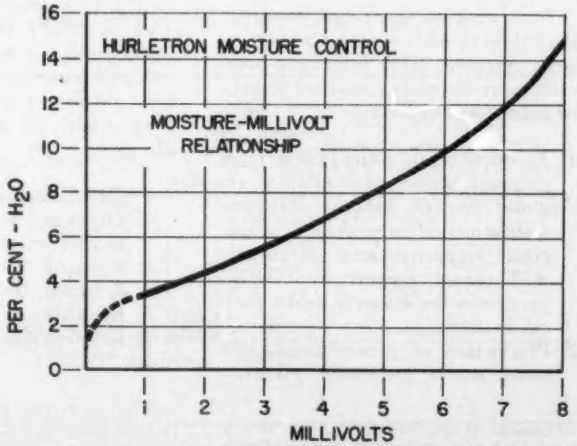


Fig. 7—Curve showing per cent moisture and millivolt relationship.

The chemi-mechanical (Bauerite) pulping process*

LeROY BAUER
Eastern Division Manager
Bauer Bros. Co.

Pulps produced by the Bauerite process are used in book, magazine and newsprint papers and in foodboard and boxboard.

THE UTILIZATION OF HARDWOODS in all sections of the world has been a perplexing question. We all recognize the economics involved. In some areas softwood is not available at a cost that would contribute to competitive pricing of our end product. In other areas good woods management has taught us the need for its use. As a result, an extensive research program was embarked upon by our universities, pulp-producing firms and various research groups. One of these research groups was the Fibre Products Laboratory, by which today's only successful system was designed. This process is called "The Chemi-Mechanical Process". However, its true industrial title is "The Bauerite Process".

I do wish to point out, however, that due to the very favorable results obtained, other intersting processes were developed that are worthy of mention. They are:

1. Production of groundwood from chipped wood. Advantages are closer control, superior strength, utilization of any shaped wood, equal capacity and brightness with equal power input. This process is the Bauer All-Mechanical Process.
2. Production of groundwood pulp using stones for coarse grinding and finishing with double-disk refiners. The advantages are superior strength, greater production from present equipment and about 10 per cent power savings.

The Bauerite installations

The first Bauerite process on a commercial basis was installed at Gould Paper Co. This installation was quickly followed by several others — all of which are successful. One of these is now being expanded to 200 tons per day. Many more mills have this process in their plans for future construction and expansion. The pulps produced have been used in book, magazine, news, foodboard and boxboard.

The flexibility of the chain of equipment makes it possible to produce a wide range of pulp products. This flexibility is in keeping with the economy of today. Our machines are still run by papermakers who must produce a quality product. The basic chain of equipment consists of:

1. Debarking and chipping
2. Digesting or impregnation
3. Liquor extraction
4. Refining
5. Screening and cleaning
6. Bleaching
7. Refining for strength development

The cold soda pulp produced with this system has been used up to 30 per cent of the fibrous furnish partially replacing spruce groundwood and some of the unbleached kraft in printing grade papers.

The pulp mill itself is operated from a central control panel and is completely automatic, the operation including the bleach plant being carried out by two men per shift. The digester controls are located on this panel. The operator sets up the cycle and, if set on automatic operation, the cycle will repeat itself again and again without his personal attention. The unit can also be operated manually if he so desires. He can make changes at any time during the digester cycle. A flow diagram is tied into the operation with indicating lights. This shows at a glance what is happening throughout the entire plant.

The logs of beech, birch, and maple are drum-barked and chipped in a ten-knife chipper. A 3/8-in. chip is used to obtain good penetration. The chips are stored and then conveyed by a belt conveyor to the weigh hopper equipped with high and low probes. The load being charged to the digester can be varied through the use of these two probes. The amount of wood being used is recorded. A worm conveyor carries the chips from the hopper into the top of the digester.

Chip digestion

After one cook is completed and the digester blown, the blow valve closes, and the chips are automatically charged from the weigh hopper

*Presented at the December 2, 1957, Pulp & Paper Conference at the University of Florida in Gainesville.

to the digester. The inlet valve closes, and the chips are impregnated with cold caustic, having a strength of approximately 25 gms per liter. This is done by a high-volume pump (P1, Fig. 1) with the vent valve 5 open. When the digester is filled the vent closes, the high-volume pump is shut off, and the high-head pump (P2) cuts in to bring the pressure to 150 psi. The pressure is held for approximately 20 min. Then the liquor, not absorbed, is blown back through a strainer in the lower cone to the storage tank. A pressure of 50 psi is then built up with air, and the digester is blown into a live-bottom bin. The digester then automatically repeats the cycle. The total cycle covers about 30 min. with an approximate yield of 87-92 per cent.

The storage liquor is refortified once each eight-hour shift. The wood absorbs about 2½-4 per cent NaOH, based on wood. The chips are loaded into the digester at about 12 lb. per cu. ft.

The digester is a 175-cu. ft. unit. For larger productions, the M & D continuous digester would be considered in place of the rapid cycle unit. However, mill conditions would dictate the choice.

Fiberizing and refining

The pressafiner extracts the spent liquor and defiberizes the chips. The chips enter the press at about 50 per cent and are discharged at about 65 per cent. The Pressafiner has been completely redesigned, using approximately 2.9 hp days per ton. This operation, in a sense, is a washing stage as water is added following the Pressafiner, diluting the stock to 15 per cent consistency.

The masticated chips are conveyed from the press and fed by a variable-speed screw feeder to the primary double-disk refiner. The excess feed returns to the Pressafiner discharge. The primary refining is carried out at about 15 per cent consistency, with water being added at the inlet to the refiner. The double-disk refiner is a No. 411 — 800-hp unit. Plates of pattern C-927 are generally used; however, other designs can be more effective depending upon the end product desired. The heads of these refiners revolve in opposite directions at a speed of 1200 rpm.

The defiberized chips are then conveyed to the second-stage refiner. This refiner is again a No. 411 — 800-hp unit but having plates of design similar to C-906. The refining is carried out at approximately 8 per cent consistency at this point. The stock is dropped into a stock chest,

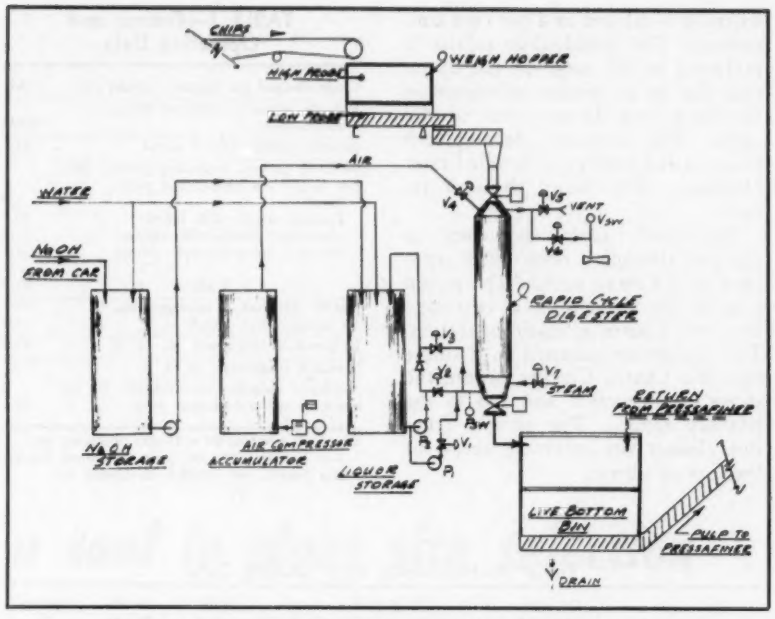


Fig. 1—Diagrammatic presentation of rapid cycle chip digestion.

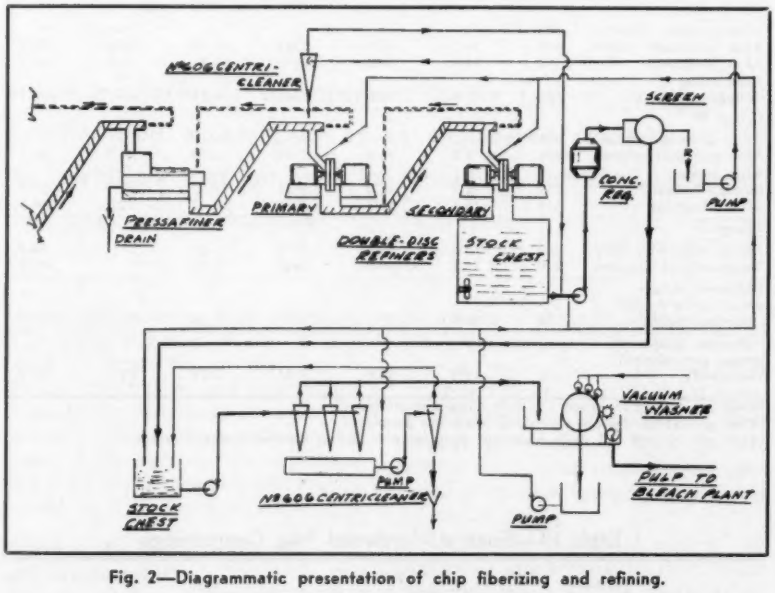


Fig. 2—Diagrammatic presentation of chip fiberizing and refining.

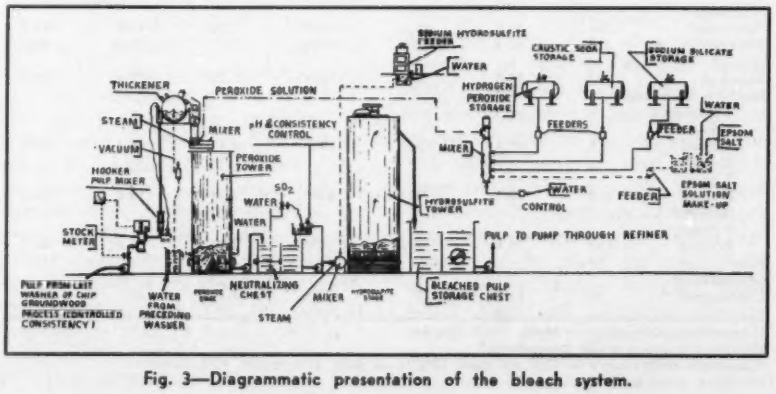


Fig. 3—Diagrammatic presentation of the bleach system.

where it is diluted to 4 per cent consistency. The double-disk refiner is preferred at this stage of the operation due to its greater efficiency in fiberizing and dispersement of the chips. The strength development phase of the refining is handled after bleaching in a pump through refiner.

The stock from the chest is pumped through a consistency regulator to a Cowan screen. The screen accepts are cleaned in a two-stage No. 606 Centri. Cleaner operation. The rejects are pumped to a single No. 606 Centri. Cleaner, where the shives are separated and fed to the primary refiner. The accepts from this cleaner are returned ahead of the Cowan screen.

TABLE I—Process and Operating Data

Chips charged per digester, air-dry tons	1.042
Pulp per digester (bleached basis), air-dry tons	0.883
Bleached yield, % on wood	84.7
Refining power, brake-horsepower days per air-dry ton unbleached pulp:	
Pressafiner	2.9
Primary double-disk refiner	20.9
Secondary double-disk refiner	22.7
Tertiary pump-through refiner	4.2
Total	50.7
NaOH absorbed in impregnation, % on moisture-free wood	3.9
Unbleached brightness, % G. E.	43.8
Bleached brightness, % G. E.	72.2
Available chlorine (as NaOH), % on moisture-free unbleached pulp	11.5

Based on a survey of a 10-day operating period. For quality data on pulp produced during this period, see TABLE II, Group 2.

Table II—Hardwood Pulp Quality Data

	Canadian Standard Freeness cc.	TAPPI Burst Factor	TAPPI Tear Factor	TAPPI Breaking Length, m	Bulk cc./gram	G. E. Brightness, %	Opacity, %
Group A[a]							
After primary refiner	583	—	—	—	—	—	—
After secondary refiner	328	11.7	45.5	2795	2.43	40.0	96.1
After bleaching	352	14.8	51.2	2970	2.21	70.0	86.3
After pump-through refiner	382	17.8	54.6	3742	2.18	—	86.1
Group B[b]							
After primary refiner	605	—	—	—	—	—	—
After secondary refiner	387	8.5	33.2	2164	2.73	41.7	93.3
After pump-through refiner	259	12.2	35.9	3052	2.37	43.8	94.7
After bleaching	313	13.4	40.1	3248	2.27	72.2	86.5
Group C[c]							
3-stage refined-bleached	246	23.3	61.2	4430	1.92		84.8
3-stage refined-bleached	220	22.1	60.0	4440	2.07		85.6
Reference sample spruce groundwood (unbleached)	90	16.6	49.5	3875	2.34	57.1	97.7
Reference sample spruce groundwood (bleached)	100	15.3	50.6	3493	2.28	71.0	93.9

[a]Data are average for seven (7) daily composite samples.
[b]Data are average for ten (10) daily composite samples.
[c]Data are for two (2) daily composite pulp samples having superior strength values.

Table III—General Hardwood Pulp Comparisons

Wood Mixture	Canadian Standard Freeness	TAPPI Burst Factor	TAPPI Tear Factor	TAPPI Breaking Length	Bulk CC/Gram	G E Brightness	Opacity %
Northern[a]							
Hardwood	246	23.3	61.2	4430	1.92	72.2	84.8
Bleached	220	22.1	60.0	4440	2.07	70.0	85.6
Spruce[b]							
Bleached	100	15.3	50.6	3493	2.28	71.0	93.6
Southern Hardwood[c]							
Unbleached 2 Stage Refined Bleached	215	15.1	61.2	3030	2.33	48.1	91.0
2 Stage Refined Bleached	219	18.1	71.2	3540	2.15	59.0	83.0
3 Stage Refined	212	15.6	72.4	3170	2.31	60.8	84.2
Fine[d]							
Groundwood							
Unbleached	70	11.0	39	2580	2.5	58	96

[a]Composite pulp sample — beech, birch, maple
[b]Northern printing grade groundwood
[c]Composite pulp sample — 30% red gum, 30% black gum, 15% maple, 25% mixed
[d]Southern news grade

The accepts from the cleaning system are thickened on two vacuum washers whose discharge consistency is approximately 15 per cent.

Peroxide-hydrosulfite bleaching

The unbleached pulp, having a brightness of 40-45 G.E. is diluted and pumped to the bleach plant. Here the pulp is diluted and metered to a pulp mixer, where it is brought to a pH of 2.5 to 3. It is then washed and thickened to 14 per cent consistency on a vacuum decker.

The pulp is introduced to a mixer and brought to a temperature of 180° F, while being mixed with the peroxide bleach. The peroxide bleach is made up of .05 per cent Epsom salts, 5 per cent silicate, 1.5 per cent sodium peroxide, 0.21 to 0.625 per cent hydrogen peroxide (100%) based on 2 or 3 per cent sodium peroxide being applied and retained in the high-density tower for approximately 1½ hr.

In the bottom of the tower the stock is diluted to about 4 to 5 per cent and neutralized with SO_2. This stock is heated to 140°F and then pumped to a mixer and mixed with 1 per cent sodium hydrosulphite. The pulp is held in the low-density

(Continued on page 100)

Table IV—Peroxide-Hydrosulfite Two-Stage Process for Bleaching Chemi-Mechanical Prepared from Chips

Chip species — beech, birch and maple
Pulp off brown stock washers — pH approximately 10.5

Mill Procedure

1. Dilute pulp from brown stock washers to pumping consistency. Brightness 48-50 G. E.
2. Acidify with about 2% H_2SO_4 (cold, low consistency, pH 2.5 to 3.0); wash and thicken to 15% consistency using fresh water showers on washer. Brightness 49-51 G. E.
3. Peroxide Bleach — 1.5 hours, 14% consistency, 180°F
   Chemicals Used
   - 0.05% Epsom salt
   - 5.0% Silicate
   - 1.5% Sodium peroxide
   - 0.625% Hydrogen peroxide (100%) G. E. 72-73 (Mill trial)

   Diluted stock at the base of the high-density peroxide bleaching tower is neutralized to pH 6.0 with SO_2 (about 8 lb/ton).
4. Sodium Hydrosulfite Bleach —
   1.0 hour, 140-150° F, 4-5% conc.
   Chemicals Used
   1.0% Sodium hydrosulfite G. E. 76-77

Hydrosulfite bleach was carried out in a low-consistency, upflow bleaching tower.

Total Chemicals Cost — including chemicals, steam, H_2SO_4, SO_2 etc.

Process	Cost/Air Dry Ton	App. Bgt. B. E.
Single-Stage (2% sodium peroxide)	$10.50	70-72
Single-Stage (3% sodium peroxide)	14.35	73-75
Double-Stage (2% sodium peroxide + 1% sodium		

Soil mechanics

— a tool in plant site selection

B. S. PERSONS
Dames & Moore

Soil mechanics is as important to the cost of design, construction and maintenance of an engineered structure as are the materials that go into the structure and the equipment that goes in the structure.

BY FAILING TO take soil mechanics into consideration, a paper mill located in the Tennessee Valley was forced to spend an additional $50,000 on foundation piling needed to support a mill on a selected site that —as was subsequently discovered—was traversed 3 ft. beneath an apparently solid surface by a ravine filled with unconsolidated and soft sediments.

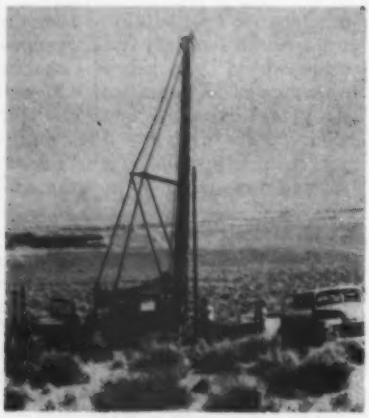
Soil mechanics is a tool useful in the selection of a site for a new industrial plant location. It is extremely valuable and can save tremendous cost when used properly by the engineers of an organization seeking a new location. But before soil mechanics can be used, and used properly, it must be understood.

The theorist has defined soil mechanics engineering as, "That science dealing with the mechanics of soil as applied to engineered construction". He further defines soil as any "unconsolidated material that can be excavated and handled with pick and shovel". In practice it is far more than this, and it is in the practical application that the industrialist finds his primary interest. Soil mechanics is a dollar-and-cents thing—it is a factor as important to the cost of design, construction and maintenance of an engineered structure as are the materials that go in the above-ground frame of the structure, the equipment that goes in the structure and the intended uses of the structure.

What is the importance of soil mechanics?

It has been said that factors of primary importance in the selection of an industrial location include the cost and availability of labor; the cost of bringing in raw materials; the cost of distribution, power and fuel; the availability and quantity of water, and facilities for waste disposal. In addition to the above, there is always added the availability of suitable sites. Little consideration has been given in this listing to the actual construction cost and satisfactory behavior of the installation itself. By engineering analysis the modern engineer is able to predict within a reasonable degree of accuracy the cost of the above-ground plant. The mechanics of the soil underlying this plant can influence the cost of the over-all project from 5 per cent to as much as 50 per cent. These moneys, if applied to things other than foundations, could be spent for desirable extras and could be incorporated in the above-ground construction of the facility.

In order to understand more of soil mechanics engineering, let us visualize how the soil mechanics engineer approaches the problem of site selection. He is a specialist, concerned with the application of a particular structure or types of structure to the earth's crust, but his appraisal of the soil encompasses not only the behavior of the structure on the soil and of the soil on the structure, but also such other considerations as the continued satisfactory performance of the structure, the possibilities of future expansion of the plant, the possibilities of a process change bringing about added loads and additional requirements for above-ground engineered construction of such things as liquid and solid storage facilities.



Field explorations conducted under the supervision of an engineer furnish subsurface information and yield undisturbed samples of the soil.

Factors entering in site selection

In approaching site selection, the soil mechanics engineer first considers the geological development of the area or areas under option. While utilizing the skills of geology (many times by employing the services of a consulting geologist) the soils engineer is not concerned with the academic approach to geology, but rather the effect that geology has had on the soil and rock, the building base of a particular area. His appraisal takes into consideration the nature and location of the bedrock face, the period of its birth and how it got there. He seeks an understanding of the nature and manner in which the soil overlying the rock came to be, whether the soil was once in-place rock itself. It might be residual soil from the decaying of the original rock, or alluvial material having been deposited by the various forces of nature (water, wind, seismic forces and glaciers). It might even be unnatural and deposited by man in the form of compacted fill or refuse dumps. Finally, the soils engineer is concerned with the latent dynamic forces of the earth, the seismic activities, which in their shifting and shearing are of major influence to the engineering performance of a given structure. These are the geological considerations given to the selection of a suitable site.

Often during this appraisal several of the sites are discarded as being unsuitable because of poor soils known to exist within a given area, or because of other geological features that would render impractical the location and operation of an industrial plant.

The next phase, site reconnaissance, overlaps geological studies. Here the soil mechanics engineer frequently discovers features of the geology or topography of a particular area that would seriously influence the application of a particular plant to a given area. A site reconnaissance frequently reveals such features as the possibility of sink holes or rocky areas covered by only a thin mantle of soil. Examination of the drainage net and the resulting topography in alluvial areas frequently reveals suspicious locations that may contain soft sediments and undesirable deposits that would influence the performance of the proposed structure.

During this site reconnaissance the soil mechanics engineer can usually predict whether or not suitable materials are available at nominal cost for compacted fills and earthwork. Site reconnaissance frequently reveals whether or not excessive cost will be necessary in order to construct transportation facilities such as railheads and roads. During site reconnaissance the soil mechanics engineer may suggest to the design engineers that consideration be given to the modification or rearrangement of a plant layout so that the subsurface exploration program that follows may utilize that portion of the proposed site that will provide the best foundation conditions.

Subsurface exploration

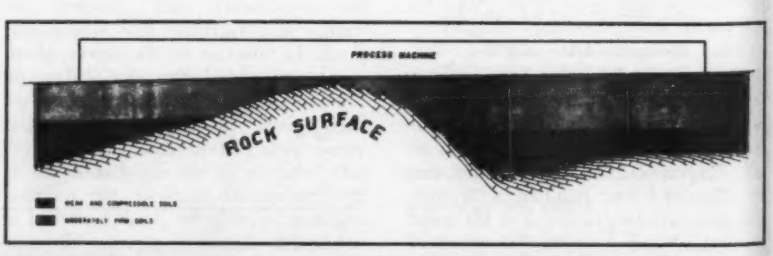
Preliminary subsurface explorations follow the reconnaissance. These explorations include the drilling of test borings and the taking of undisturbed samples of the soils encountered. The exploration borings provide detailed information regarding the exact nature of the soils beneath the surface. Here it is determined if these soils will lend themselves to the building and maintenance of the proposed plant.

In years past it was accepted practice to conduct purely exploration borings with wash rigs or well-drilling rigs and take no samples of the soils encountered. The data obtained from these explorations generally told little or nothing about the subsurface conditions. Precision borings from which samples were extracted were performed after the preliminary boring—though often at the same location. In modern practice all borings are performed with the same care and precision. Undisturbed samples are taken of all soil strata.

Frequently at the end of field explorations it will be apparent that one or more of the possible sites is not suitable for the location of the proposed plant, and at this time such sites may be discarded. More refined data are often necessary to determine the actual costs of plant foundations at one location as compared with costs at another location.

Laboratory testing of soil samples

Laboratory testing of soil is much the same as physical testing of any other engineeering material. Tests are performed under conditions simulating the conditions of the soil in nature. These tests measure the various properties of the soil that will be of importance in the prediction of the behavior of the soil, if and when it underlies the proposed plant. From the resulting laboratory data, engineering analyses are performed to determine the actual building loads that the soil will sustain, the amount of soil that must be penetrated by piles in order to provide a given capacity, the settlement of the area under existing natural loads and also under the loads imposed by the proposed new plant, means of increasing or retarding settlements, the availability and suitability of materials for earth fill, the methods of placing fill materials and other data that are pertinent to the actual cost of the foundations of the proposed new plant. When these studies are presented to the consulting industrial design engineer, he has before him actual figures that he may use in determining the cost of a plant foundation in a particular location.



The soil profile shows the variety of foundation problems beneath a process machine.

Pipe, fittings, valves and pumps

(Continued from page 88)

in accordance with ASA B16.22 in sizes to fit ASTM B88 copper water tube in sizes ⅛ in. through 4 in.

Where copper piping materials are used for sizes above 12 in. the fittings may be made by mitring the copper pipe or tube and assembling with silver solder.

Copper tube of any size may be flanged by the lap joint method by clamping a steel back-up flange at the proper distance from the end of the tube to allow sufficient material to form the lap. The tube end is then heated with a gas torch and the end flared out and hammered flat with a wood mallet.

As in the case of aluminum, copper pipe may be cut with a common hand saw.

Polyvinyl chloride plastic pipe and fittings

Polyvinyl chloride is one of the relatively new plastic materials available in piping form. It is made in sizes ½ in. through 6 in. in seamless type to dimensions of schedule 40 and 80 steel pipe. Piping is made from unplasticized polyvinyl chloride plastic in normal and high-impact strengths. The high-impact type sacrifices some of the corrosion-resistant properties of the material.

A full line of fittings is obtainable in both screwed and socket welded types. The welding of polyvinyl chloride pipe is usually a cementing or solvent welding operation.

The material may be cut with a saw or pipe cutters.

This material requires very frequent supporting, and it is usually more economical to support it continuously in an angle iron or similar member.

In designing a piping system, close attention should be given to the flexibility of the system since polyvinyl chloride has a high coefficient of expansion.

Larger sizes of this pipe are becoming available and are useful where the service pressure and temperature are within their useful range.

Polyvinyl chloride piping materials are limited to services of about 150° F or less. This piping material is available from a number of sources.

Polyethylene plastic pipe and fittings

Polyethylene is another plastic piping material that is available and has been introduced comparatively recently. It is available in sizes ½ in. through 6 in. Polyethylene pipe is flexible and therefore resembles hose. While ASA pipe has a fixed outside diameter for each size with the inside diameter varying according to the wall thickness, polyethylene is normally made with the inside diameter remaining the same for each size regardless of wall thickness. The reason for this is that the plastic fittings used must slip into the end of the pipe, as does a hose fitting, and the end of the pipe is clamped to hold it on the fitting. The inside diameter is normally the same as that of schedule 40 steel pipe.

Polyethylene pipe made from both virgin and reprocessed polyethylene is available.

The only standard for this material is Department of Commerce commercial standard (S197-57).

This pipe is made with wall thicknesses corresponding to schedule 40 steel pipe and other thicknesses designed to withstand certain working pressures.

This pipe should be continuously supported and can be cut with a knife.

Optimistic future

(Continued from page 90)

duction and those projected for 1965 and 1970 represents our estimate of an opportunity for further expansion of capacity by the United States paper and board industry over the coming decade.

Expected wood pulp production by 1965 and 1970

The increases in domestic wood pulp production that will be required to produce the estimated domestic output of paper and board in 1965 and 1970 and to produce the non-paper and board products made from wood pulp will depend on several factors. Principal among these will be the extent to which we import wood pulp from Canada and Scandinavia and the pulp furnish used for each type of paper and board. We will concentrate here on the increase in domestic wood pulp production that will be required for paper and board production, since the wood pulp used for the production of rayon and other non-paper and board products characteristically accounts for only about 5 per cent of the total wood pulp consumed by the United States.

Based upon the probable wood pulp consumption per ton of product for future years, the estimated future domestic production of paper and board by type and the estimated domestic production of non-paper and board products from wood pulp, it is estimated that domestic wood pulp consumption in 1965 will be about 33,000,000 tons, and in 1970 about 39,000,000 tons, reflecting increases in wood pulp consumption over 1957 of about 40 per cent by 1965 and an increase of about 66 per cent by 1970.

As to pulp imports, it is expected that our net imports of wood pulp will amount to about nearly 3,000,000 tons in 1965 and about 3,500,000 tons in 1970.

The wood pulp requirements for domestic production, taken together with the expected import-export balance, indicate that there will be a lot of room for expansion of the domestic wood pulp industry over the next decade. It is expected that we will have an increase in domestic production of wood pulp between 1957 and 1965 of over 8,000,000 annual tons, an increase of about 38 per cent, and an increase between 1965 and 1970 of another 6,400,000 tons, or an increase in that period of about 21 per cent.

Expected pulpwood production by 1965 and 1970

An increase in domestic wood pulp production of this size will require a very significant increase in the amount of pulpwood to be drawn from the forests of the nation. Taking into account the differences in pulpwood consumption per ton of the different types of pulp and the amounts of each type of pulp that will be used in the production of the different types of paper and board and other pulp products, it is estimated that the pulpwood requirements in 1965 will amount to about 3.4 billion cu. ft. of solid wood, an increase of about 38 per cent over the nearly 2.5 billion cu. ft. consumed in 1957, and in 1970 about 4.1 billion cu. ft., an increase over 1957 of about 67 per cent.

Whether or not the projected levels of consumption and production of pulp, paper and board can be attained in the future will depend in large measure upon whether or not conditions of production will be such that the prices of pulp, paper and board can be kept in about the same relationship to the prices of competing materials and the general level of prices as in the past. Since pulpwood is the basic ingredient for the production of wood pulp, paper and board, and since the cost of wood may account for from 20 and 30 per cent of the total cost of an integrated producer of paper and board, the availability of pulpwood at prices the industry can afford to pay will be a primary determinant of the relative growth of pulp, paper and board production that will occur in each region of the nation over the coming decade.

Hurletron moisture control

(Continued from page 93)

trol dryers. The method is not affected by variations in speed, caliper, weight, pH, material content, tension or atmospheric conditions. Readings are in per cent moisture by weight, not total water content of the entire sheet.

Advantages of the Hurletron system

Among the advantages claimed for the Hurletron automatic moisture control system are the following:

1. Provides good moisture control. Moisture is one of the most difficult specifications to meet because the control is at the "tail end" of the process. The Hurletron system gauges moisture with extreme accuracy and controls it to remarkably close limits. Profile variations, or streaks, are revealed to operators who can eliminate them by adjustments at the wet end of the machines.
2. Produces sheets of higher moisture content. Without automatic controls moisture varies so much that the operators must overdry the sheet to prevent the peaks from exceeding specifications. The Hurletron system makes it possible to operate with an average of 1 - 2.5 per cent higher moisture.
3. Reduces heat consumption. The Hurletron system saves fuel by reducing overdrying. The dryers at the end of the section that formerly produced overdrying are put to proper use. A greater utilization of steam and less steam waste are important benefits of the system.
4. Provides a weight advantage per ton of paper or board. When the moisture content of paper or board is raised 1 per cent, an equal weight of fiber is displaced to reduce the amount of solids in the sheet. Making the same grade of paper or board at higher moistures results in greater tonnage and increased revenue.
5. Higher speeds are made possible. When overdrying of the sheet is reduced, more steam and dryers are made available for the drying process. Some of the capacity gained is required for reserve to maintain proper control, but much of it can be used to dry a greater amount of production. This will permit machines now "running as fast as they can dry" to increase speeds and produce sheets closer to specifications.
6. Reduces bench sampling. The Hurletron system provides a chart showing a continuous record of the moisture in the sheet. This reduces the amount of sampling. Large board sheets are spoiled by sampling, and this can waste one-half ton of board per week.
7. Permits faster grade changes. The same grade of board can be produced with an identical set point as that used on a prior run. This set point adjustment is easily made by a knob on the controller case. In many instances changes can be made "on automatic"; others require manual regulation of the steam to prepare the control dryers for the new load. When the new grade arrives at the gauges, set point is shifted to a known position. The automatic is switched on and the dryers are under accurate and automatic control.
8. Maintenance is low. The wear strips on the thermocouples have a life of six to eight years under normal operation. No lubrication is required, just an occasional dusting with an air blast. The instruments chosen are standard electric recorders and pneumatic controllers that have excellent records.

Bauerite process

(Continued from page 96)

tower for 1 hr. This tower is of the up-draft type. It is discharged to a storage chest at a G.E. brightness of about 74 to 78. The approximate cost for chemicals, steam, etc. is about $16 to $20 per air-dry ton. The stock is then pumped to a pump-through refiner for strength development. (This machine is more efficient than the double-disc unit when used for strength development under these conditions). After passing through the refiner the stock goes to the machine storage chest.

Table I shows the process and operating data in brief. The bleaching phase differs from that discussed here, however. Table II shows the quality data based on the Gould operation. Table III shows a comparison between both northern and southern hardwoods. These are all from commercial runs. We have used up to 85 per cent southern hardwoods succesfully in production of news running at 1000 fpm. The two-stage, peroxide-hydrosulfite bleaching procedure is described in Table IV.

Special attention should be given to the strength and freeness comparison. It will be noted that the hardwood has equal strength values at the higher freeness. It can be seen that the Tappi Test Factors, in the case of the hardwood pulp, are superior to that of the spruce groundwood at the lower freeness. However, the hardwood pulp is down slightly in opacity as compared to spruce groundwood.

This pulp has had excellent runability on a paper machine producing book and printing grade papers.

Summary

The Chemi-Mechanical Process produces yields from 87 to 92 per cent from New England hardwoods with a pre-treatment of 3-4 per cent cold caustic. This may be converted, with 35- 50-hp days per ton, to a pulp of excellent strength. The strength varies from good spruce groundwood to 50 per cent stronger than book grade groundwood. The pulp is readily bleached to a G.E. brightness of 75 to 77. It has been run at levels of 30 per cent of the fibrous furnish in direct substitution for spruce groundwood. It has been found possible to reduce the long-fibered pulp in the furnish by 25 per cent. In the case of news grades the substitution has been up to 60 per cent and greater. The pulp has improved machine formation, super calendering operations and consequently the finish. It improves wire drainage and facilitates drying operations.

A study is now underway to determine the effects of pressure, temperature, time and concentration on yield, chemical absorption and other properties of the resultant pulp. It is expected that the data obtained will enable us to arrive at an optimum condition of treatment.

ERRATA

(1) The 40-in. Bauer Bros. Co. double-disk refiner, equipped with screen feeder and drainer conveyor, used in brown stock washing at the St. Regis Paper Co. mill in Jacksonville, Fla., was erroneously listed in the list of equipment (page 911, February issue) as an E. D. Jones & Sons Co. refiner.

(2) A typographical error remained undetected in the list of equipment on page 989 (March issue) under "Water Supply". The equipment in question are Infilco's Accelator units, which are also illustrated at the bottom of page 988 and are erroneously identified as a Graver Water Conditioning Co. water treatment system.

ANTARA Paper Chemicals

IGEPAL CO-630 BLANCOL IGEPAL DM-710	PITCH REMOVAL OR DISPERSION EMULSIFIERS for OILS and WAXES	IGEPAL CO-530, CO-630, DM-710 EMULPHOGENE AM-870 EMULPHOR EL-620, EL-719 KATAPOL PN-430
IGEPAL CO-630	BLACK LIQUOR LOSS REDUCTION SEQUESTRANTS FOR IRON, MANGANESE, COPPER, CALCIUM	CHEELOX B-13, HE-24, BF-13, BF-ACID
IGEPAL CO-630 NEKAL WS-25	PAPER REWETTING OPTICAL BRIGHTENERS	BLANCOPHOR HS-71, HS-76 LS-81, HS-31
IGEPAL CO-630 IGEPON T-33	FELT WASHING CALENDER COLORING	SAVANOL A EMULPHOR EL-719

Our sales and technical personnel are ready to show you how Antara paper chemicals can work for you — write us today.

From Research to Reality

ANTARA CHEMICALS

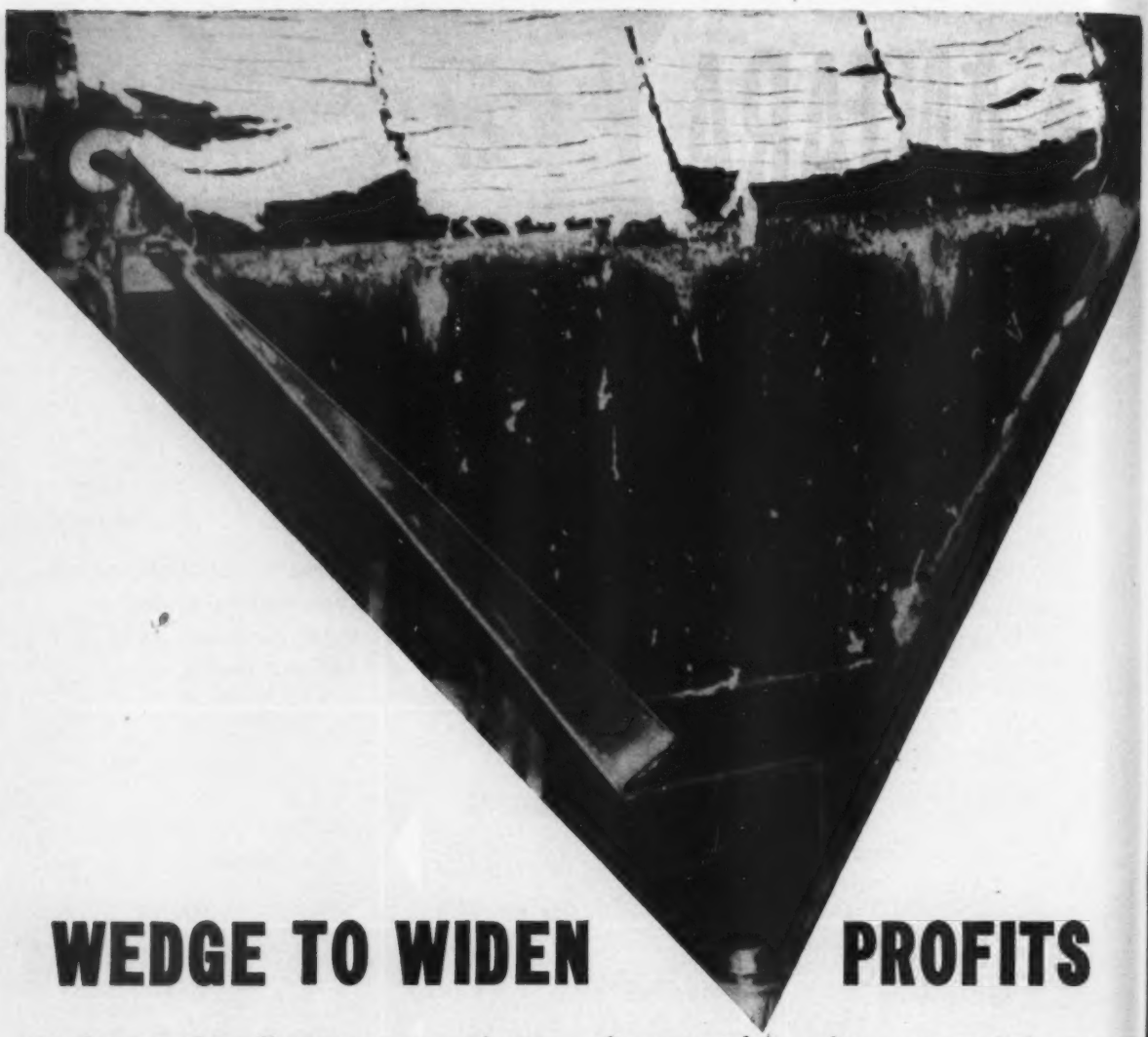
A SALES DIVISION OF

GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

SALES OFFICES: New York • Providence • Philadelphia • Charlotte • Greensboro • Chicago
Portland, Ore. • San Francisco • Los Angeles. IN CANADA: Chemical Developments of Canada, Ltd., Montreal

ANTARA gaf



WEDGE TO WIDEN PROFITS

Good papermaking fibres are too expensive to procure and prepare to let any of them get away, especially in these days of narrowing profit margins.

Putting in a Bird Save-All to recover them is just like putting money in the bank.

Installation, operating and maintenance costs are low. Simple gravity is the separating force. No vacuum, no chemicals, no storage problems.

In countless cases the Bird Save-All has demonstrated its value as a practical economy measure.

Let us show you how substantial your net savings might be — before you invest in recovery equipment.

BIRD MACHINE COMPANY
SOUTH WALPOLE, MASSACHUSETTS

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND CO., Limited, Montreal

The BIRD SAVE-ALL

CURRENT COMMENTS

Nationalism to the North . . . newsprint: the long fight . . . and expansion

by WARREN B. BULLOCK

Trouble is in prospect for the American paper industry's investments in Canada if the campaign program of the re-elected premier is put into effect. In 1955, according to a Canadian government commission, United States investors held 45 per cent of the Canadian pulp and paper industry, and the percentage has been rising. Premier John Diefenbaker won an astoundingly complete victory in the recent general elections based in no small part on his appeal to a rising nationalistic sentiment.

A closer control, financial and governmental, of American investments in Canada was part of his platform. Without spelling out the details, he advocated a larger participation of Canadian capital in American-controlled Canadian corporations and an increased Canadian personnel in the top management.

How this control might be exercised is evidenced by the resentment of Canadians over the refusal of Ford Co. of Canada to accept an order for 1000 cars for Red China. The parent American company believed that such a sale would conflict with United States laws. Diefenbaker cited this as an example of conditions he proposes to change.

The new Canadian nationalism is again shown by an appeal already filed with GATT to permit an increase in duty rates aimed against the United States. And this at a time when the United States Congress is considering legislation to permit further reduction of United States duties.

Now an invasion

Formerly welcomed in Canada, American investment capital is now called an economic invasion.

Some years ago, when Canada threatened an embargo on exports of pulpwood to the United States, a United States senator pointed out that Canada was not immune to retaliation, with its network of Canadian railroads on the United States side of the border and the Canadian dependence on the United States for sulfur and other materials needed by its pulp and paper industry. This threat in a speech before the United States paper industry stopped for all time the agitation by Canada for embargos on shipments to this country. The present U. S. ambassador to Canada has quietly commented on the new Canadian nationalism: that just as Canada does not wish to be taken for granted, "neither do we."

The perennial problem

The perennial problem of the newsprint industry versus the newspaper publishers has taken a new form. At a time when the North American newsprint capacity is far above any prospective immediate demand from the publishers, the new Democratic senator from Wisconsin has introduced a bill to authorize financial assistance for an experimental newsprint mill; to provide an opportunity for decentralized local forest industries to solve the unemployment problem, and to encourage the development of locally-owned newsprint mills.

The newspaper publishers whose legislative demands drove the newsprint industry from the United States to Canada, wrecking the industry's economy for a generation, is now asking further consideration from Congress. The American Newspaper Publishers Association appeared before a Congressional committee in support of a bill to permit newsprint in rolls 13 in. in width to be admitted duty-free, as against the present rule that any paper under 15 in. in width is dutiable. The domestic printing paper industry, through Robert E. Canfield, president of the Printing Paper Manufacturers Association, countered with statistics to show that such a change would allow Canada to displace United States production of paper for commercial printing such as sales books, counter books, flyers and dodgers. Canfield said to the Committee: "In the case of rolls narrower than 14½ in., such uses are not merely the chief use, but the sole use."

A symposium before the New York division of the Salesmen's Association of the Paper Industry brought together William Dwight, president of the ANPA, and Charles F. Honeywell, executive secretary of the Newsprint Service Bureau. Dwight expressed a hope for sufficient available newsprint to meet the anticipated future increase in public dependence on the newspapers. Honeywell said that at a sacrifice of present and future profits the newsprint industry expanded its production capacity at tremendous cost. He answered the criticism that many mills devoted large sums to modernizing existing machines instead of building new mills by saying that the speeding up of old machines made it possible to meet the demand more quickly than would have been possible through the installation of complete new equipment. How newspaper publishers have found it unprofitable to operate their own mills was shown by the fact that since World War II 13 paper mills were purchased outright or in part by publishers, but only two are now making newsprint full time. Three are making newsprint on a part-time basis, and eight are out of the newsprint business entirely. "Let the shoemaker stick to his last" was not what Honeywell said, but plainly implied.

Midst the recession: the future

The nation's economic position is not deterring the paper industry from looking to the future. Herbert T. Randall, vice president for research and engineering of Champion Paper & Fibre, has been named president of a Champion subsidiary to be known as Shasta Pulp & Paper Co. with a view to determining whether conditions are favorable to the building of a pulp and paper mill with a capacity of 300 daily tons at a cost of $30,000,000 in an area 60 miles northeast of San Francisco. Union Bag-Camp has floated a $30,000,000 loan with Equitable for the furthering of its development plans. The Albany, N. Y. mill of Allied Paper, closed for a

Smidth

For Reburning Lime Sludge

We are specialists in the design and manufacture of rotary kilns, coolers and auxiliary equipment for burning lime, lime sludge and for many other purposes.

Over 1,250 Smidth rotary kilns have been furnished all over the world.

F. L. SMIDTH & CO.
Engineers and Machinery Manufacturers
11 West 42nd Street • New York, N.Y.

F. L. Smidth & Co., A/S
77 Vigerslev Alle
Copenhagen, Denmark

F. L. Smidth & Co., Ltd.
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co. (Bombay) Private Ltd.
42 Queen's Road
Bombay, India

Current Comments . . .

year, is being put into operation by new owners and will employ 100 men in the production of industrial towels and tissues.

Mergers continued to develop within the paper industry in the past month, some of which were:

International Paper acquired through an exchange of stock the Lord Baltimore Press of Baltimore, Md.

West Virginia Pulp & Paper has acquired Fulton Bag & Products of New Orleans through a cash transaction. Fulton specializes in heavy-duty kraft bags and will be operated as a division of West Virginia.

Financial Reports

Paper mill securities remained relatively stable during the weeks of March and April, when talk of recession seemed to be disturbing businessmen in all lines of endeavor.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Apr. 10, 1958	March 10, 1958
American Can	44½	42⅜
Celotex	27⅞	28⅝
Same Pref.	17¾	17⅞
Certain-Teed	9⅛	9¼
Champion P & F.	36¼	37⅞
Same Pref.	*94-96	96
Chesapeake	26⅛	26½
Container	18⅞	18¼
Same Pref.	96	*95-98
Continental Can	47¼	45
Crown Zellerbach	44⅛	45⅛
Same Pref.	*97-97½	97
Diamond Gardner	28½	28⅜
Eastern	28¾	20¼
Federal Paper Board	35	34⅜
Same Pref.	*20-20½	20⅛
Fibre Paperboard	23¼	26⅝
Same Pref.	92	*93-95
Great Northern	39⅛	41⅝
Hammermill	23	23
International	88½	88½
Same Pref.	*93½-95	*91½-95
Kimberly-Clark	53½	51¾
MacAndrews & Forbes	*26-26½	26¾
Masonite	29¼	29½
Mead	33⅝	35
Same Pref.	*94-95½	*92-94
Minnesota & Ontario	24	24¼
Oxford Paper	29¾	29½
Same Pref.	92½	91½
Rayonier	15⅝	16¼
Riegel	22⅛	23⅜
St. Regis	30⅝	30¼
Same Pref	*94-96	*93¼-94½
Scott	62½	63½
Same $3.40 Pref.	81	80
Same $4. Pref.	98	*95½-97½
Sealright	23	26⅞
Sutherland	33	33⅛
Union Bag-Camp	31½	31
United B. & C.	*21¼-21⅞	21¾
United Wallpaper	6⅜	6⅜
Same Pref.	*13½-15½	*13½-15½
U. S. Gypsum	71¾	70¼
Same Pref.	162	164
West Virginia P. & P.	33¼	34⅛
Same Pref.	*93½-94	*96¾-96

New York Stock Exchange — Bonds

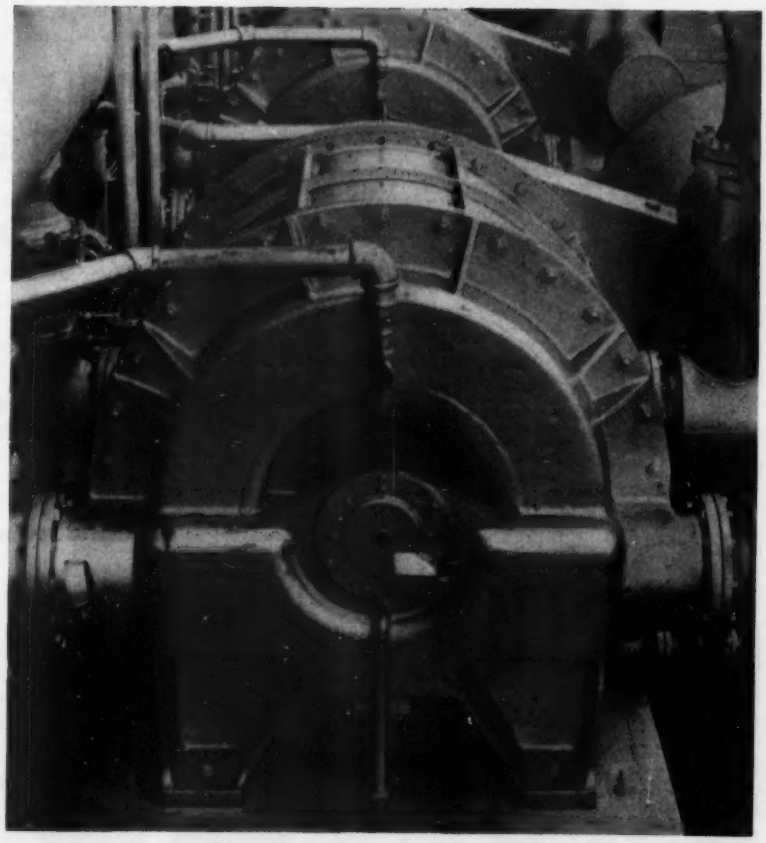
A P.W. Products 5%	91	75
Champion P & F 3¾%	—	95¼
Champion P. & F. 3%	95¾	93
Mead 3%	93	—
Scott 3%	100½	99½

American Stock Exchange — Stocks

Allied Paper	9⅛	7⅞
American Writing	18	18½
Brown Company	10⅝	10⅛
Puget Sound	15	14½

*Closing Bid and Asked Prices.

High machine speeds?
High temperature headbox stock?
You need NASH Vacuum Pumps!



Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

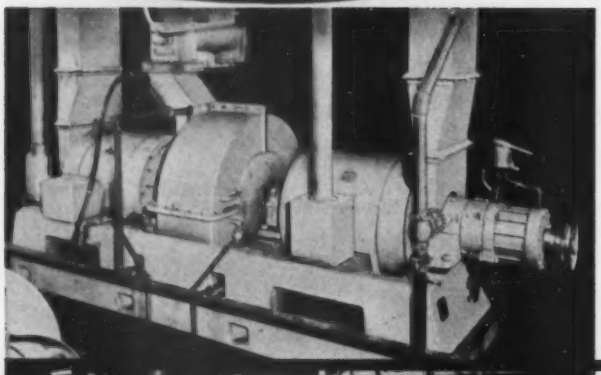
NASH ENGINEERING COMPANY

441 WILSON ROAD, SO. NORWALK, CONN.

3 REFINER DESIGNS CAN HANDLE TODAY'S PULP REFINING PROBLEMS

and

ONLY BAUER OFFERS ALL 3

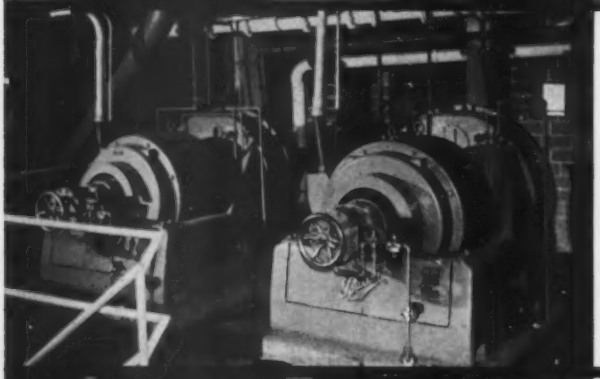


DOUBLE REVOLVING DISC

Bauer double revolving disc refiners are used in this semi-chemical system.

SIZES: ranging from twin 24" discs powered by two 100 HP motors up to 40" twin discs with two 400 HP motors.

APPLICATIONS: Because of their high differential speeds, double revolving disc refiners are recommended when highest quality fiberizing or dispersing is the main requirement.



SINGLE REVOLVING DISC

These Bauer single revolving disc refiners are producing fiberized stock from ground-wood screenings.

SIZES: from a small laboratory model with an 8" disc and a 10 HP motor, up to 40" disc refiners with 800 HP motors.

APPLICATIONS: Excellent for refining long, stringy, fiberous pulp or for stock when strength development or high crush are the principal needs.

PUMP-THRU

Bauer Pump-Thru refiner gives stock final refining in this semi-chemical corrugating medium mill.

SIZES: 32" disc, with up to 400 HP motor; 44" disc, with up to 800 HP motor.

APPLICATIONS: For stock preparation and specific fiberizing operations. Combines efficiency of a disc mill with the advantages of a jordan. Automatic controls available.

FOR SPECIFIC RECOMMENDATIONS...

THE BAUER BROS. CO

1759 SHERIDAN AVENUE
SPRINGFIELD, OHIO

DISC REFINER HEADQUARTERS

NEWS of the INDUSTRY

West Virginia Pulp & Paper Acquires Two A&S Bag Plants

Arrangements have been made for West Virginia Pulp & Paper Co. to purchase two multiwall bag plants operated by Arkell & Smiths. At the middle of April the sale was still subject to the approval of A&S stockholders.

David L. Luke, president of West Virginia, reported that his firm would pay cash for A&S plants at Wellsburg, W. Va., and Mobile, Ala. (The transaction does not include operations at Canajoharie and Hudson Falls, N.Y.)

In a similar action early in April, West Virginia absorbed Fulton Bag & Products Co. of New Orleans as a division. The Louisiana firm operates plants at New Orleans and St. Louis producing multiwall paper sacks, paper pockets, waterproof paper-lined bags, textile bags, canvas products and other specialties.

Luke declared that the Arkell & Smiths plants and those of Fulton Bag & Products would become components of West Virginia Pulp & Paper's Multiwall Bag Div. These acquisitions mark the paper manufacturer's entry into the multiwall sack converting field, a major market for the company's new Clupak stretchable paper.

Covington Research Expanded

In another expansion move West Virginia Pulp & Paper is broadening its research and development activities at Covington, Va., to include an equipment engineering section. This section will be responsible for the development of new equipment to bring research projects to commercial actuality. It will also study the possible improvement of existing papermaking equipment.

Fred H. Freuler, who has been promoted to associate director of the Covington research laboratory, has over-all direction of the new function. He heads up the firm's papermaking research program, including developmental work on Clupak stretchable paper at the Charleston, S. C. mill.

Kimberly-Clark Corp. of Neenah, Wis., has announced that the capacity of its new creped wadding plant in New Milford, Conn., will be doubled. The first wadding machine was to go into operation during April, but plans are already underway to match its 75-ton daily capacity with a second unit.

Getting the bugs out of pulpwood . . .

ON-THE-SPOT spray treatment of cut pulpwood in the woods has proved highly effective in reducing insect loss. Nekoosa-Edwards has devoted the research of 10 years to the problem.

Nekoosa-Edwards Tackles Insect Loss in Pulpwood

A LONG-RANGE study undertaken by Nekoosa-Edwards Paper Co. in 1948 has just about licked the problem of insect loss in stored pulpwood. Research was financed by the Port Edwards, Wis. firm's Nekoosa-Edwards Foundation.

Insect loss in wood storage has been a costly problem for the pulp and paper industry. Storage time and other factors affect the degree of loss, but it can run as high as $2.54 per cord.

Nepco was one of the first firms to recognize the problem and initiate an effective control program.

The research project leading to the development of that program was headed by Dr. Roy D. Shenefelt, professor of entomology at the University of Wisconsin in Madison. From the hundreds of insect species present in stored pulpwood, Dr. Shenefelt and his associates narrowed the list of suspects to three: the roundheaded borers (*Cerambycidae*), the flatheaded borers (*Buprestidae*) and the bark bettles (*Ips* and *Dendroctornus*).

Modus Operandi

The culprits of the wood yard have a definite method of operation: In the life cycle of the borers the adult cuts a slit in the bark of a log and lays an egg in the cambium region. The egg develops into a larva known to most fishermen as a "wood grub". As the larva grows it enters the pulpwood stick by chewing wood fibers and reducing them to sawdust. During the tunneling galleries and pupal cells are formed in the wood. The latter are about 3 in. long and 1 in. in width. The larva then chews a channel to the edge of the pulpwood stick to provide an exit. It then returns to the cell, where it develops into an adult, and from which it emerges to begin a new cycle.

The bark beetle enters a pulpwood stick and remains beneath the bark, where it feeds and makes radial galleries or small grooves on the wood surface. Here the female lays her eggs. Bark beetles do not create a large direct wood loss, but they carry on their bodies various wood fungi that cause rot.

For some time the theory was held that control meas-

ures should be focused on wood yards. But, further research has established that the real control spot is in the woods. The adult insect may attack a pulp stick and lay its eggs within eight hours after a tree is cut during the warm summer months.

In order to reduce losses, then, the wood has to be used green and must be transported to the mill and used immediately. Wood that is to be stored must be sprayed with chemicals during the day of its cutting.

Spraying with BHC (benzene hexachloride 12 per cent gamma isomer) at the rate of 1 oz. gamma per 1 gal. of water over the surface of the pulpwood sticks and over the top and face of the pile has been found to give nearly 100-per cent control.

A commercial test of this procedure was performed during 1957 on summer-cut wood in the Superior National Forest. The project was undertaken by Tomahawk Timber Co., a Nekoosa-Edwards and Mosinee Paper Mills Co. subsidiary. Losses in woods storage were reduced to a negligible point.

$4,000,000 Rayonier Woodmill on Stream at Grays Harbor Div.

TAKING "FULL ADVANTAGE of the fast-changing pattern of wood-growth in the Pacific Northwest" is the new $4,000,000 Rayonier Inc. woodmill at the Grays Harbor Div. in Hoquiam, Wash.

On stream and already proving its value and versatility, the plant supplies raw material to the division's chemical cellulose and fine paper mill. It converts into uniform chips wood of almost any dimension: from 3½-in. diameter sticks to 5½-ft. diameter forest giants in lengths of from 8 to 40 ft.

The woodmill formerly operated at Hoquiam was designed and built in an era when wood consumers relied for the most part on large logs of fairly standard size. However, modern tree farming produces logs of all sizes: those thinned from second- and third-growth stands and those from over-mature old-growth timber.

Good conservation practices, according to George A. Holt, call for the utilization of all available wood. The new mill, he said, is designed to realize full utilization. Holt is resident manager at the Grays Harbor Div.

Favorable Cost Basis

The mill is designed to produce an hourly 100 tons of bone-dry chips on a favorable cost basis.

Small logs entering the plant are barked in a drum barker and then reduced to chips in a 110-in. diameter six-knife chipper. While larger logs are treated in a hydraulic barker, where a water stream of 1000 gpm under pressures of up to 1700 psi tears the bark to shreds. These logs are then conveyed to a 153-in. diameter eight-knife chipper. In 10 seconds logs of up to 20 ft. in length and 34 in. in diameter are reduced to chips.

Furthering the Goal

The new woodmill also has facilities for receiving, cleaning and storing chips from other forest products plants in the area. In almost all cases these are chips produced from wood that was previously burned and discarded. Thus Rayonier furthers the goal of complete utilization of all the wood taken from the forest.

A general contractor was not retained for the woodmill project. Providing all engineering and construction supervision was Rayonier's central engineering office at Hoquiam, headed by Ralph Kutchera. Field engineer in charge was Robert Pearson.

Plans Call for Merger of Standard Packaging and Eastern Corp.

Standard Packaging Corp. and Eastern Corp. have reached basic agreement on the terms of merger. This agreement is of course subject to approval by the respective boards of directors and stockholders. Also concerned are certain financial commitments under restrictive loan agreements and certain legal requirements.

For each share of Eastern's common stock Standard Packaging will exchange 8/10 share of its common

50-TON EDERER log-handling crane is shown lifting logs from water storage to the saw deck at the new Rayonier woodmill operation.

AERIAL VIEW of the new Grays Harbor Div. woodmill in Hoquiam, Wash., showing the log-handling ways and chip storage silos. The plant can handle logs in diameters from 3½ in. to 5½ ft. and in lengths of up to 40 ft.

Now there's a NEW Pusey and Jones!

New management and extensive executive reorganization have virtually made a brand new company of Pusey and Jones!

Many improvements have resulted from it, among them on-time start-ups and even better performance from the complete line of Pusey and Jones Paper Making Machinery.

Ask your representative about the *new* Pusey and Jones, and how your company can benefit. Or write.

Paper Machinery Division

THE PUSEY AND JONES CORPORATION

WILMINGTON 99, DELAWARE

Shipbuilding • Heavy Metal Fabrications

EXPORT DIVISION: FRAZAR AND COMPANY, 50 CHURCH STREET, NEW YORK 7

POWELL

world's largest family of valves

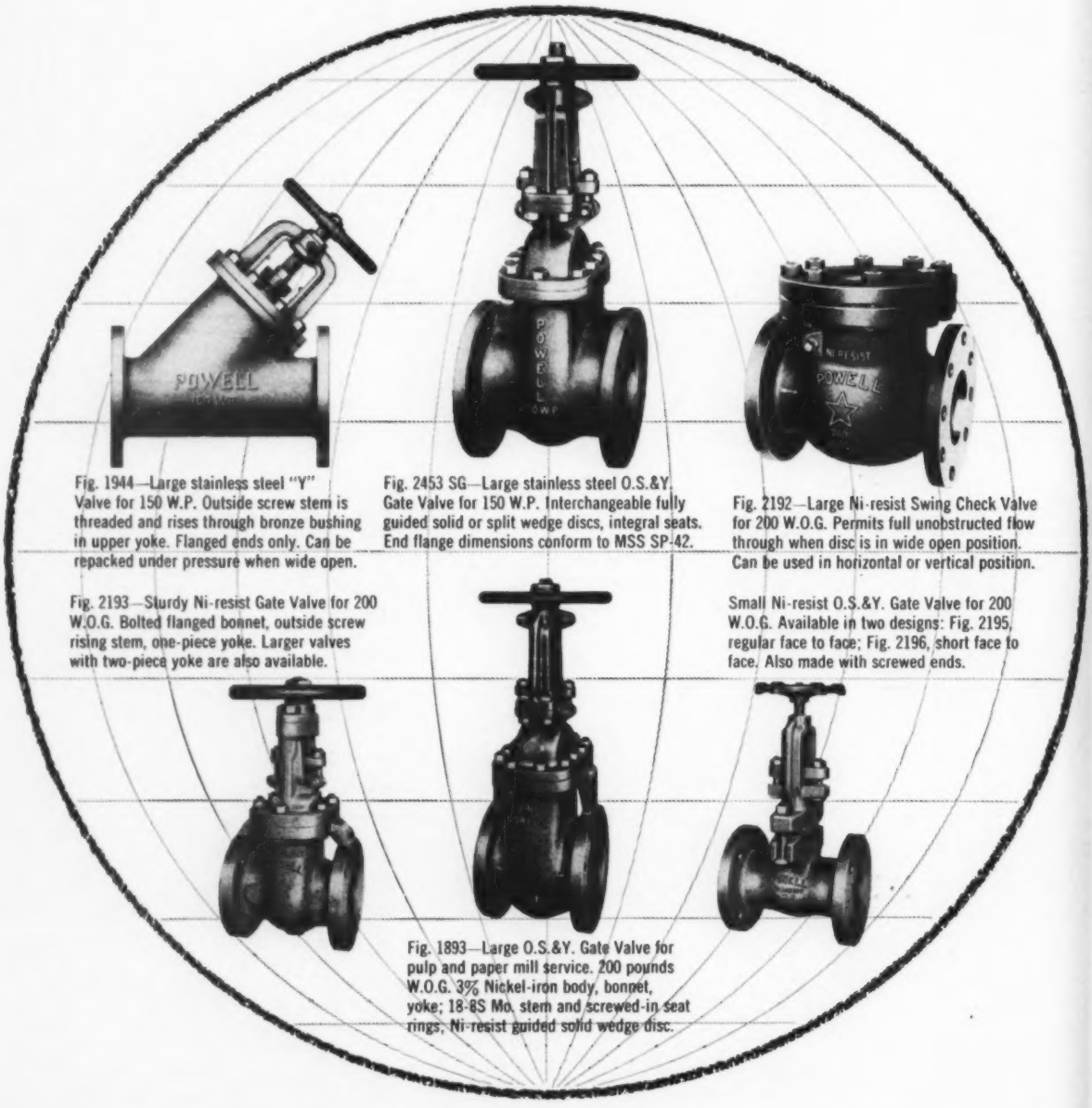


Fig. 1944—Large stainless steel "Y" Valve for 150 W.P. Outside screw stem is threaded and rises through bronze bushing in upper yoke. Flanged ends only. Can be repacked under pressure when wide open.

Fig. 2453 SG—Large stainless steel O.S.&Y. Gate Valve for 150 W.P. Interchangeable fully guided solid or split wedge discs, integral seats. End flange dimensions conform to MSS SP-42.

Fig. 2192—Large Ni-resist Swing Check Valve for 200 W.O.G. Permits full unobstructed flow through when disc is in wide open position. Can be used in horizontal or vertical position.

Fig. 2193—Sturdy Ni-resist Gate Valve for 200 W.O.G. Bolted flanged bonnet, outside screw rising stem, one-piece yoke. Larger valves with two-piece yoke are also available.

Small Ni-resist O.S.&Y. Gate Valve for 200 W.O.G. Available in two designs: Fig. 2195, regular face to face; Fig. 2196, short face to face. Also made with screwed ends.

Fig. 1893—Large O.S.&Y. Gate Valve for pulp and paper mill service. 200 pounds W.O.G. 3% Nickel-iron body, bonnet, yoke; 18-8S Mo. stem and screwed-in seat rings; Ni-resist guided solid wedge disc.

A solution for every kind of flow control problem is as near as your local Powell distributor. Powell valves are designed and engineered in the largest variety of metals and alloys, to handle any medium, every flow control requirement. There are Powell distributors in all principal cities. Or, if yours is a special engineering problem, write to:

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

and one share of a new cumulative convertible preferred. Also under the merger plan Eastern will distribute its holdings in Rayonier Inc. pro rata to its shareholders prior to the merger becoming effective.

R. Carl Chandler will continue as chairman of the board and chief executive officer of Standard Packaging. Harold Holden, president of Eastern, will become vice chairman of the board responsible for the over-all operations of the Eastern Corp. Div. Continuing as president of Standard Packaging will be Dr. John A. Keenan.

Standard Packaging produces flexible packaging, folding cartons, paper and aluminum foil labels, paper cans, paper pre-packaging trays, milk bottle closures and plasticized paper plates. While Eastern manufactures fine business papers and bleached sulfite pulp and through its Royal Lace Div. turns out paper shelving, paper place mats, paper and plastic doilies, gift wrappings, etc.

Chesapeake Corp. Marks Major Step in Expansion

Chesapeake Corp. of Virginia has placed in operation a third set of screw-press washers. The units will help increase the capacity of the pulp mill from 600 to 750 tons per day.

The improvement marks the next-to-last major step in the expansion program undertaken in 1953. The final step—which was scheduled for May 1—will be the operation of a new 500-ton chemical recovery boiler.

The three sets of screw presses wash the chemicals from the pulp stock, which is converted into kraft paper, paperboard and baled market pulp.

The new set of presses was furnished by Valley Iron Works Co. of Appleton, Wis. A major improvement in the new equipment is the variable-speed drive provided by the Dynamatic Div. of Eaton Mfg. Co. of Kenosha.

The older presses operate at an unchangeable 60 rpm, while the new units can be varied between 30 and 65 revolutions.

Link-Belt Co. furnished the rubber belt conveyor system that moves the pulp to storage tanks, from where it is fed to the paper mill. Also built by Link-Belt were (1) the inclined screw conveyors that carry the pulp to each screw press and (2) the vertical screw conveyor that lifts the pulp from the presses to the belt.

U. S. Plywood Defers Mill Construction

United States Plywood Corp. has "deferred" its plan to construct a paper mill on the West Coast. This according to the *New York Journal of Commerce*, which commented that the action was taken "in the light of weaker market conditions".

The large plywood producer and distributor had been conducting studies on the West Coast aimed at the eventual establishment of a mill in the area, where it owns or controls large forest resources.

The decision to go slow on the paper project comes at a time when United States Plywood is experiencing rough market conditions in plywood and when a company spokesman has stated that although orders are very satisfactory, low prices have depressed profits.

Olin Mathieson Enters Folding Carton and Corrugated Fields

Olin Mathieson Chemical Corp. is entering the folding carton field and will establish production facilities at West Monroe, La. In a previous announcement the firm has reported plans to produce corrugated containers in Cincinnati.

Production at West Monroe is scheduled to start in the fourth quarter. Cartons will round out the Forest Products Div.'s line of Frostkraft packages (including the corrugated containers produced at Cincinnati).

At Cincinnati production is to be undertaken about the middle of the year in a plant leased from Lunkenheimer Co. After remodeling, the plant will house an 85-in. corrugating machine plus auxiliary equipment. The latter is to be transferred from the present facilities in West Monroe, where a pulp and paper mill is now operated by the division.

Oxford Paper Purchases Champion-International

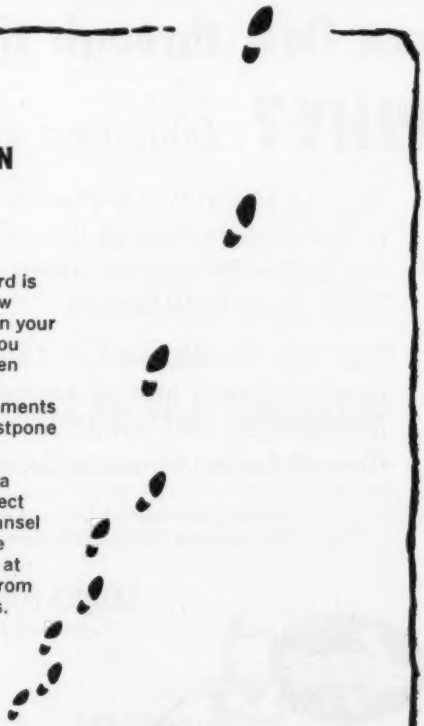
A contract has been signed whereby Oxford Paper Co. will purchase all outstanding capital shares of Champion-International Co. of Lawrence, Mass. (C-I is a wholly owned subsidiary of the National Geographic Society.)

Oxford has entered into a long-term agreement to supply the paper requirements of the *National Geographic Magazine*. Champion-International has been for many years a

EVERY STEP
IN THE RIGHT DIRECTION
IS A STEP AHEAD

Short or long, every step forward is progress. Short steps taken now in the right direction can sustain your competitive position . . . keep you poised for a major advance when the time comes to forge ahead in your business. Small improvements in present plant facilities can postpone the need for large investment.

Vital to your business future is a sound plan to measure and direct your business growth. Wise counsel in preparing that plan, and able assistance in following through at every step, is available to you from a firm of Professional Engineers.



J. E. SIRRINE COMPANY • Greenville, South Carolina
ENGINEERS FOR 56 YEARS
A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING • BUSINESS • COMMERCE • INDUSTRY

40% 40% 40%

MORE WATER

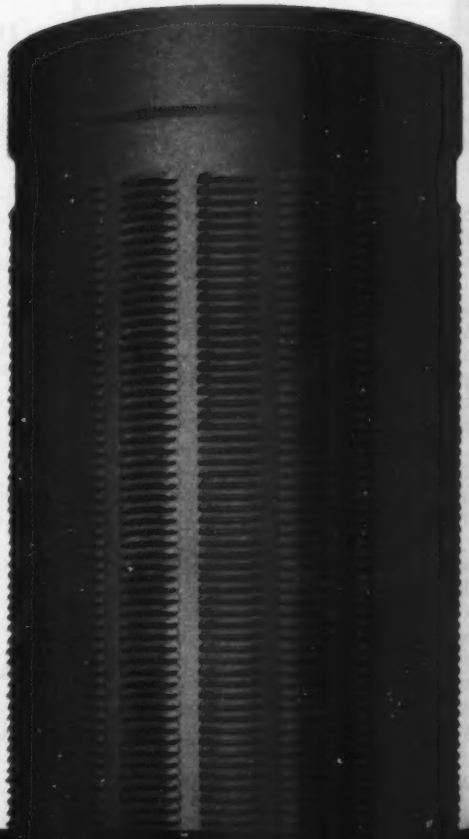
can flow through the NEW Layne 134 shutter screen

WHY? *Increased inlet area!*

Here's a screen that is even more efficient . . . has *greater strength* than the long-lasting Layne 96 shutter screen that made Layne water wells famous.

This new development of Layne creative research is used only in Layne water well installations, and available exclusively through Layne Associate Companies.

Contact your nearest Layne Associate Company for complete details.



Layne

LAYNE & BOWLER, INC. MEMPHIS
General Offices and Factory
Memphis 8, Tenn.

Layne Associate Companies throughout the world.

WATER WELLS
VERTICAL TURBINE PUMPS • WATER TREATMENT

Layne

ASSOCIATE COMPANIES

LAYNE ARKANSAS COMPANY
Stuttgart, Arkansas

LAYNE-ATLANTIC COMPANY
Norfolk, Virginia
Glen Burnie, Maryland
Savannah, Georgia
Orlando, Florida
Albany, Georgia
Florence, South Carolina

LAYNE-CENTRAL COMPANY
Memphis, Tennessee
Jackson, Mississippi
Cleveland, Mississippi
Pensacola, Florida

INTERNATIONAL WATER CORPORATION
Pittsburgh, Pennsylvania

LAYNE-LOUISIANA COMPANY
Lake Charles, Louisiana

LOUISIANA WELL COMPANY
Monroe, Louisiana

LAYNE-MINNESOTA COMPANY
Minneapolis, Minnescta

LAYNE-NEW YORK COMPANY
Linden, New Jersey
New Hyde Park, L.I., New York
Camden, New Jersey
Arlington, Massachusetts
Pittsburgh, Pennsylvania

LAYNE-NORTHERN COMPANY
Mishawaka, Indiana
Indianapolis, Indiana
Lansing, Michigan

LAYNE-NORTHWEST COMPANY
Milwaukee, Wisconsin

THE LAYNE OHIO COMPANY
Columbus, Ohio
Akron, Ohio
Lima, Ohio
Springfield, Ohio

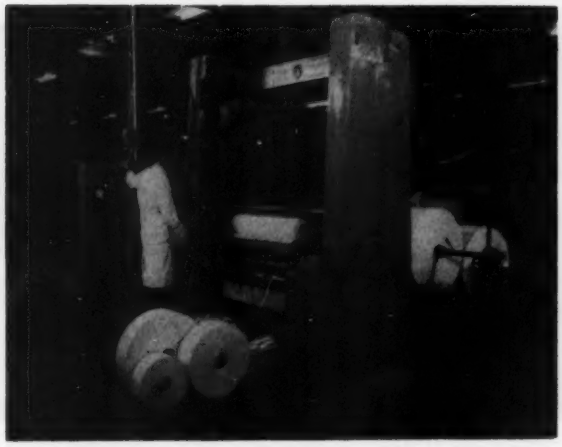
LAYNE-PACIFIC, INC.
Seattle, Washington

LAYNE TEXAS COMPANY
Houston, Texas
Dallas, Texas
Corpus Christi, Texas
El Paso, Texas

LAYNE-WESTERN COMPANY
Kansas City, Missouri
St. Louis, Missouri
Aurora, Illinois
Ames, Iowa
Omaha, Nebraska
Wichita, Kansas
Denver, Colorado

CANADA

INTERNATIONAL WATER SUPPLY, LTD.
London, Ontario, Canada
Oakville, Ontario, Canada
Montreal, Quebec, Canada
Quebec, Quebec, Canada
Saskatoon, Saskatchewan, Canada
Vancouver, B.C., Canada



NEW CONVERTING type slitter-rewinder that has been put into operation at the West Carrollton, Ohio mill of Moraine Paper Co. The unit, supplied by the Dilts Div. of Black-Clawson Co., produces rolls of from 1½ in. to 62 in. in width in diameters of up to 42 in. The machine has shear cut, pneumatically-positioned slitters. Tolerances to 1/64 in. can be held through the use of an Askania automatic edge control.

News of the Industry . . .

producer of high-quality coated printing papers. It was acquired by the National Geographic Society in 1946 after supplying the Society's paper needs since 1913.

Oxford Paper, now in its 60th year, produces high-quality book and magazine papers at mills in Rumford, Maine, and West Carrollton, Ohio.

Diversification Expanded at Fibreboard in Antioch

The major expansion of diversified productive capacity at its Antioch, Cal. board mill has been announced by Fibreboard Paper Products Corp.

To be undertaken sometime this spring was the installation of a new $500,000 off-machine coater—one of the few of its kind in the United States. The unit will be capable of applying a wide variety of coatings to paperboard in widths of up to 92 in. and at speeds up to 1000 fpm.

According to Ralph P. McDonald, general manager of the Paperboard Div., "With this new installation plastics, waterproof coatings, 'release' coatings . . ., clay coatings for quality printing surfaces and, of course, colors can be applied to paperboard at high speeds with lower production costs".

New Division Formed

Creation of a totally new operating division to coordinate the three West Coast packaging divisions of Fibreboard Paper Products has been reported by William L. Keady, president.

Jack H. Grady has been named general manager of the new division, the Packaging Group. He was formerly general manager of the Central Packaging Div.

The Packaging Group is to be responsible for coordinating the production and sales of the Northwest, Central and Southern packaging divisions.

In addition to the three packaging divisions, the departments of the new Packaging Group will include the Creative Design Center and the firm's wholly owned subsidiary, Precision Electrotype Co.

Recent Expansions in the Industry

Union Bag-Camp Paper Corp.
has arranged a $30,000,000 loan with Equitable Life Assurance Society of the United States. Proceeds —to be received in three installments of $10,000,000 each—will be used in connection with plant expansion programs at Savannah, Ga., and Franklin, Va.

Flintkote Co.
has acquired for an undisclosed amount the assets of the Chimney Div. of C. A. McRobert & Son Ltd. of Montreal, Que. It is to be operated as a division of Flintkote Co. of Canada Ltd. and will continue as the exclusive Canadian licensee for the manufacture and sale of Van-Packer prefabricated chimneys for residential construction. (Van-Packer was acquired by Flintkote in 1956.)

Lily-Tulip Cup Corp.
has reported that the official opening of its new Riverside, Cal. plant took place May 6, and that full pro-

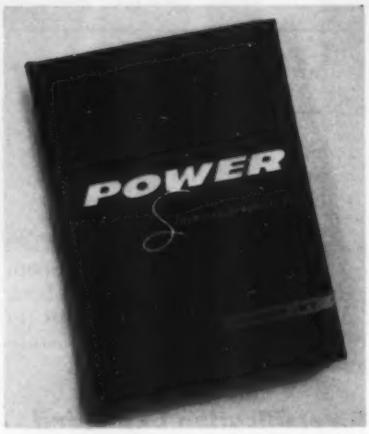
News of the Industry . . .

duction is scheduled for the third quarter. Limited production is now underway. Output will consist of many of Lily's nearly 600 items in the cup and container line. Special construction features include an underground tunnel system for the 15 service lines required; air conditioning and humidity control in manufacturing areas and offices, and a glass-enclosed boiler room.

Allied News Notes . . .

Shuler & Benninghofen, Hamilton, Ohio felt manufacturer celebrating this year as its 100th anniversary, has won the National Safety Council's Public Interest Award for 1957. Its category: business magazine advertising.

Power Stainless Products Co. of Passaic, N. J., has announced the affiliation of **Stainless Piping Supply Inc.,** Charleston, W. Va. The move brings complete coverage in corrosive-resistant materials to the Ohio River Valley, the East, Southwest



and South. . . . At the same time it was reported that both firms are now making available the first all-inclusive, hard-covered and bound catalog published exclusively on a complete line of corrosion-resistant materials. (See page 136.)

Penick & Ford Ltd. Inc., corn refiners for the paper and other industries, has moved its New York, N.Y. executive offices to 750 Third Ave.

American SF Products Inc., distributors of heating and drying equipment for the pulp and paper industry, has moved into new and larger quarters at 420 Lexington Ave., New York, N.Y.

Shell Chemical Corp. has begun shipping hydrogen peroxide in tank car quantities from its new plant at Norco, La. Shell expects hydrogen peroxide to find wide application in the fast-growing mechano-chemical pulp bleaching field.

Coming Events

Tappi

July 7-18—Seventh Statistics Course, Laval University, Quebec, P. Q.

Superintendents Association

June 3-5—National Meeting, Statler Hotel, Boston

Other meetings

May 19-23—National Safety Council, Safety Management Techniques Training Course, Chicago

May 20-21—National Paperboard Association (spring meeting), Santa Barbara Biltmore Hotel, Santa Barbara, Cal.

June 2-4—Canadian Pulp & Paper Association (Technical Section summer meeting), Chateau Frontenac, Quebec, P. Q.

June 22-27—Forest Products Research Society (12th annual meeting), Madison, Wis.

ENGLISH CLAYS AMERICAN

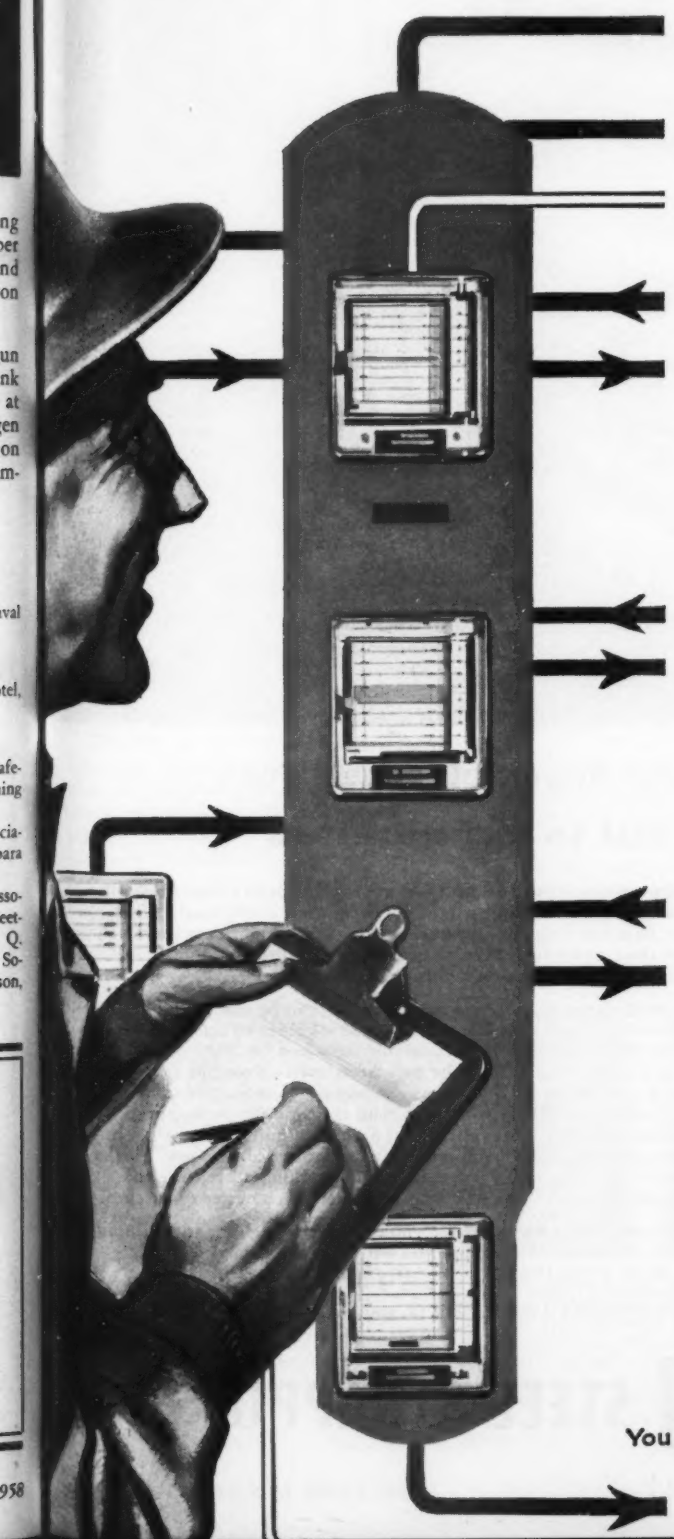
UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation

6 East 45th Street, New York 17, N.Y.

Nothing gets by

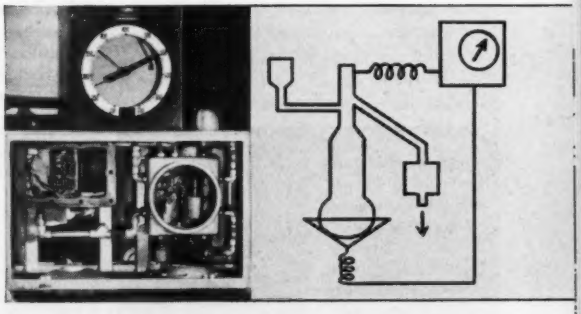
Automatic end-point testing device developed by Standard Oil research men makes certain of the uniform quality of gasoline and diesel fuel delivered to you.



Scientists at Standard Oil never stop in their drive to improve and then improve again the uniform quality of the petroleum products that bear the Standard Oil trade-mark. These engineering research scientists have now created wholly new instruments for performing near continuous physical analysis *automatically.*

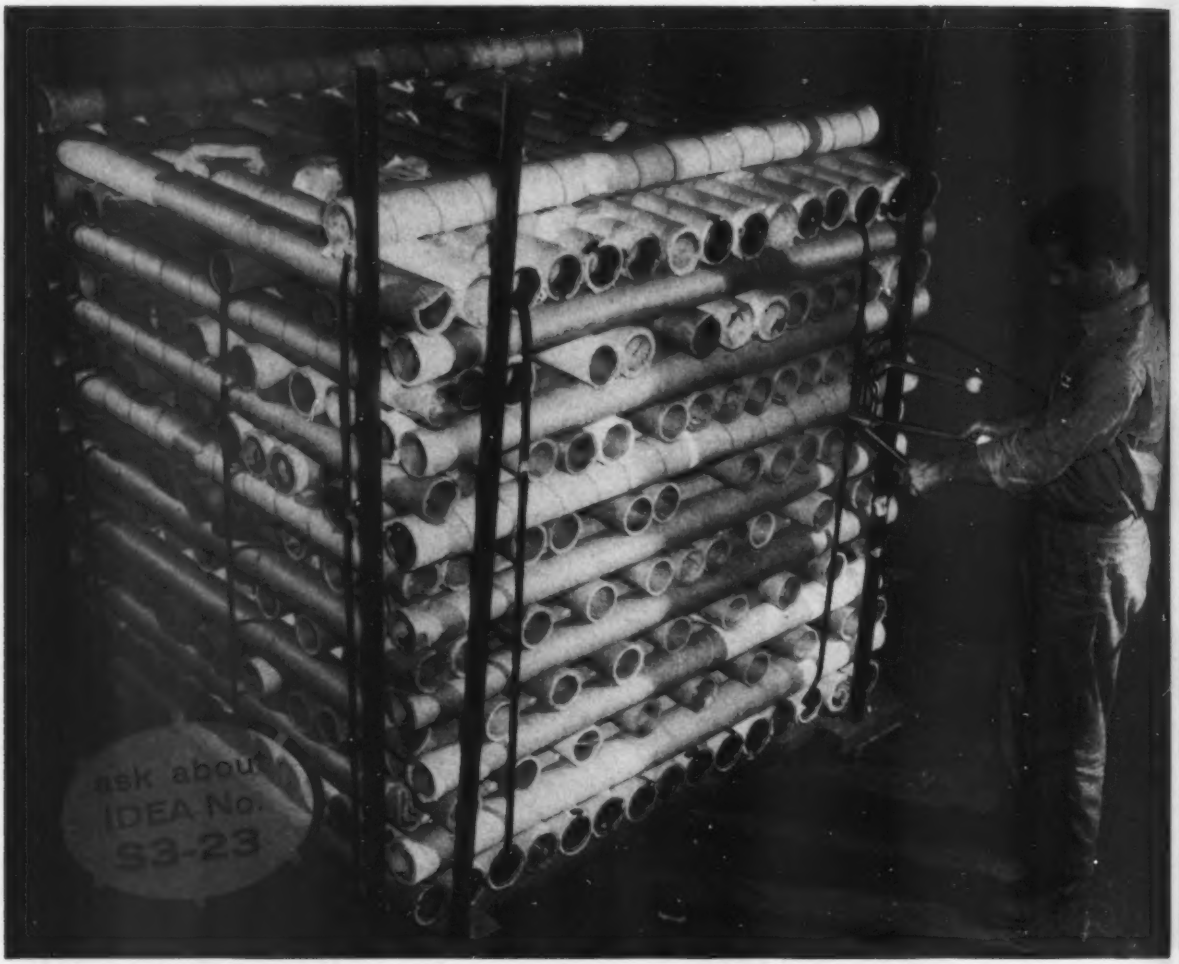
One such instrument automatically performs the physical analysis that determines end-point. Using it, refineries maintain a continuous inspection of the temperature at which gasoline and diesel fuels are completely distilled. To you, this means that Standard is able to maintain a constant control over the uniformity and high quality of (1) the fuels you burn for heat or use to power your diesel engines and (2) the gasoline for your truck fleets. It also means that power- and heat-producing petroleum products, with their constantly controlled end-point, burn uniformly, give you uniform high performance.

This is part of the research pay-out, the "something more" research builds into the products you buy from Standard. This is your return from Standard's investment in research. And now there are 48 district offices in the 15 Midwest and Rocky Mountain states to serve you. Call the one nearest you. **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**



Automatic end-point tester works this way. A small sample is placed in an electrically heated flask. The temperature is measured and recorded during a heating cycle when distillation is accomplished. Distillate is condensed and drained, the flask temperature is lowered by introduction of the next sample, and the apparatus is ready for another test.

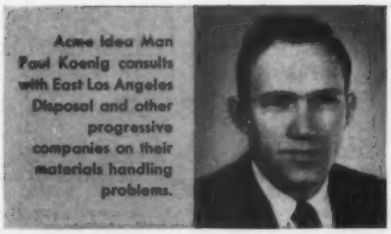
You expect more from STANDARD and get it!



Trust your AIM*. . . East Los Angeles Disposal does . . .

Truck loading time cut to 20 minutes

Handling large steel strapped units of newsprint cores mechanically—rather than many small bundles by hand—means faster truck loading and unloading for East Los Angeles Disposal Company and their customers. By working with their Acme Idea Man, the company developed a quick, easy method of unitizing with Acme Steel Strapping. (Idea No. S3-23)



Acme Idea Man Paul Koenig consults with East Los Angeles Disposal and other progressive companies on their materials handling problems.

The average steel strapped unit of about 225 cores can be assembled much more quickly than the same number of cores tied together in small bundles of 15. The new B5 Stretcher makes tensioning easy and fast. And it takes much less time to load the palletized units. Now one man with a lift truck can load a truck in twenty minutes in comparison to 3 man-hours formerly needed. And he can load more on the same truck, because load size now depends on height of palletized units, rather than on height of the truck sides. Customers prefer the palletized cores, too— for they can be unloaded in ⅓ less time. The units can be stacked, decreasing the amount of warehouse space necessary, and they are much easier to inventory.

***Trust your Acme Idea Man** to help you solve your packing and shipping problems, with dollar benefits to both you and your customers. For full information, call or write: Dept. PKS-58, Acme Steel Products Division, Acme Steel Company, Chicago 27, Ill. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

NAMES *in the* NEWS

H. C. Church

E. E. Rodabaugh

Management Changes at New York & Pennsylvania

Herbert C. Church has been named director of process and product development for New York & Pennsylvania Co. Church, who will be responsible for company-wide coordination and direction of the technological progress of the firm, was formerly general superintendent of the Lock Haven (Pa.) Div.

Assisting Church will be Eugene E. Rodabaugh, manager of research laboratories. A 10-year veteran with the firm, Rodabaugh was formerly pulping technologist.

Thomas G. Williams, Lock Haven superintendent, moves up to take Church's former post as general superintendent at Lock Haven. Replacing Williams is Herman Uebel, formerly Lock Haven paper mill superintendent. Succeeding Uebel is Charles Flaig, general mill foreman; while H. D. Floruss, paper tour foreman, moves up to fill the vacancy created by Flaig's appointment.

In another New York & Penn appointment, Arthur L. Bennett has been named vice president of Armstrong Forest Co., woodlands subsidiary. Formerly manager of the Department of Woodland Operation, he succeeds E. F. (Hatch) O'Hare, who recently resigned.

KVP Co. Ltd. Reports Executive Changes

B. F. Avery has been named vice chairman of the board of directors of KVP Co. Ltd. of Espanola, Ont. He will concern himself primarily with matters of company policy.

At the same time, E. Norval Hunter was elected president of the firm in addition to his present duties as vice president of KVP Co., Kalamazoo, Mich., and president of Appleford Paper Products Ltd.

D. P. Best becomes vice president and resident manager of the Ontario company, while John C. Scarth, sales manager, has been appointed a vice president.

Scott Executive Changes

Scott Paper Co. has announced a series of executive changes affecting the administration of the Mobile, Ala. plant and the Staff Engineering & Development Div.

Joseph W. Shimp Jr., who has served as plant manager at both Fort Edward, N. Y., and Mobile, steps into the newly created position of special projects manager on the staff of Vice President Paul C. Baldwin at Chester, Pa.

Alfred J. Karpinski, who has been director of staff engineering and development at the Chester headquarters, becomes assistant general manager for production at Mobile.

James H. Coil Jr., formerly assistant secretary at the Mobile operation, has been named assistant general services manager at the plant.

Succeeding Karpinski as director of staff engineering and development at Chester is David R. Wadleigh.

1958-59 OFFICERS of the Canadian Pulp & Paper Association include George M. Hobart (1), chairman of the executive board, and R. D. Duncan, chairman of the Technical Section. Hobart is president of Consolidated Paper Corp. Ltd. of Montreal, while Duncan is assistant mill manager for Canadian International Paper Co. of Three Rivers, Que.

C. L. Dostal has been elected vice president of manufacturing for Thilmany Pulp & Paper Co. of Kaukauna, Wis. He succeeds **C. R. Seaborne,** who remains as executive vice president. Dostal has been associated with Thilmany since 1955 and was previously assistant to the executive vice president.

C. L. Dostal

J. R. Arthur

James R. Arthur has been appointed technical director of Port Huron Sulphite & Paper Co. of Port Huron, Mich. Associated with the paper industry since 1935, he joined the Port Huron staff in 1945. He had previously been chief chemist with Maxwell Paper Co. of Franklin, Ohio.

William J. Alford, since 1940 president of Continental Paper Co. —parent firm in the Alford Packaging Group, has been elected chairman of the board of directors and treasurer. Elected president at the same time was **C. L. Von Egloffstein,** a management consultant in the paper industry and a director and member of the executive committee of the company since 1956.

W. J. Alford

C. F. Watson

Charles F. Watson, former engineering department manager, has

retired after 38 years on the staff of Nekoosa-Edwards Paper Co. Joining the firm in 1920, he was named mill engineer in 1933 and four years later was placed in charge of the engineering department. He held the position of engineering manager until January 1956 and has remained with the department since that time in a staff capacity.

Roy J. Sund, executive vice president of Marathon Corp. prior to its recent merger with American Can Co., has been elected a Canco vice president. He will continue in charge of operations for the Marathon Div. . . . . In another Marathon appointment, Sund named **Ross C. Wilcox** vice president in charge of research and development.

Allied Personalities . . .

Carl C. Landegger has been named assistant general manager of the Paper Machine Div. of Black-Clawson Co., Watertown, N.Y. A B-C director and a vice president of Parsons & Whittemore Inc., his latest assignment was that of director superintendente of Companhia Federal de Fundicao in Brazil. This firm manufactures pulp and paper mill machinery.

F. F. Frothingham has retired as vice president of Bird Machine Co. of South Walpole, Mass. He remains associated with the firm in a consulting capacity. Prior to his vice presidency, Frothingham was manager of western sales at the Evanston, Ill. office. As vice president he was in charge of pulp and paper machinery sales.

Frank C. Arnold has been appointed sales engineer by Pusey & Jones Corp. He will represent the firm's Paper Machinery Div. in the New England and northern New York territory. Arnold was formerly with Downingtown Machine Works. At the same time, **E. N. Peterson,** formerly with Black-Clawson Co., was assigned to the Midwest territory.

Don H. Montville, divisional sales manager since 1954, has been named vice president in charge of sales for the Shartle Div. of Black-Clawson Co.

Shuler & Benninghofen, producer of Hamilton felts, has appointed **George E. Emigh Jr.** as representative on the Pacific Coast. He will headquarter in Portland, Ore. At the same time, **Adrian Barber** was named representative in the states of Minnesota, Michigan and Wisconsin, with headquarters in Hamilton, Ohio.

James W. Clark and **Bleecker Morse** have been named felt sales engineers for Huyck Felt Co. in the southeastern and southwestern states respectively. Clark was formerly an industrial fabric sales engineer, while Morse held a similar position in the South.

Fred N. Eastwood, formerly adhesive sales supervisor for National Starch Products Inc. at Atlanta, is assuming new responsibilities in the firm's Southern Div. at New Orleans. He will serve the paper industry in the states of Texas, Arkansas, Louisiana, Mississippi and Alabama.

Emerson Glauner has been named sales engineer for the Paper Machinery Div. of Pusey & Jones Corp. He will specialize in cylinder machine sales.

John D. Haskell, vice president of Black-Clawson Co. and president of Black-Clawson (Canada) Ltd., has retired from both positions after 37 years on the B-C staff. He has served at various times as general manager of two divisions and as

Kalamazoo Glazed Tile Tanks

Designed for the Paper Industry

6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

MORE PAPER AND PAPERBOARD HAVE BEEN PRODUCED ON HUYCK FELTS THAN ON ANY OTHER MAKE

HOW SO? Because no other feltmaker in America has made as many felts for as many years as Huyck. Nor has there ever been another make of felt offering more advantages and economies.

Equally significant, of all the felts supplied by Huyck more than 55% receive Huyck's famous, all-purpose 4-D treatment . . . over 50% contain Huyck-engineered synthetic fibers.

Why? Papermakers, specifying these felt betterments, tell us they get higher production with fewer felts. Rejects are lower. Production goes up as cost goes down. Product quality is upgraded.

Still not satisfied with felts as they are, Huyck has the largest research and development staffs in the industry — and for one good reason: to make new Huyck felts *even better.*

Huyck Felt. Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario.
Division of F. C. Huyck & Sons

NEW HUYCK FELTS

★ INDUSTRIAL FABRICS

FIRST IN QUALITY · FIRST IN SERVICE SINCE 1870

TO HELP YOU PROCESS MORE PROFIT FROM PAPER

OK BRAND

STARCHES

the complete paper mill line...

OK Keogel—An effective cold water swelling beater additive. Simple to use ...no cooking...just add to beaters. Requires no involved equipment or cooking procedures. Disperses readily ...causes no "Fisheyes." High resistance to breakdown...for better starch retention and higher strength tests and fiber bonding.

OK Keofilms—Complete range of controlled viscosity thin boiling starches ...adaptable to many surface sizing problems.

OK Keozyme—High purity, consistent, carefully processed corn starch for enzyme conversion. Exacting quality control to insure low residue and optimum conditions for proper enzyme action. For surface sizing or pigment coating binder this starch offers highest quality available.

OK Keoclors—A new line of oxidized starches...for coating adhesive and surface sizing application. Surface sizing at press or calender will benefit from controlled and stable viscosity, good penetration and color. Adhesive strength and colloidal characteristics offer improved bonding and operation for medium and low solids pigments coating.

OK Keocote—Enzyme converting corn starch with lower than normal peak viscosity. Particularly adaptable to operations requiring conversions at high starch solids or in presence of pigments. Low initial viscosity permits more rapid heat transfer and even conversion.

OK Special—Starches will be formulated for your needs... phone or write for a Hubinger paper starch representative who will be glad to help you solve any starch related problem.

The Hubinger Company

HUBINGER — QUALITY PRODUCTS — 77 YEARS — from CORN

KEOKUK, IOWA

New York • Chicago • Los Angeles • Boston • Charlotte • Philadelphia

executive vice president of the company and will continue to maintain an office at the Dilts Div. in Fulton, N.Y., where he will make his counsel available to the company and its customers.

M. A. Bell has been appointed a sales representative for Carthage Machine Co. in Florida, Alabamba, Mississippi, Tennessee, Arkansas, Louisiana and Texas. He formerly operated a wood waste utilization business in Birmingham, Ala., representing a number of manufacturers in the field.

Necrology . . .

Lloyd Lang

Lloyd Lang, recently associated with Sumner Sollitt Co. of Chicago and prominent for his work in sulfite pulping and digester circulating systems, died recently in a Neenah, Wis. hospital.

Born in 1899 at Marinette, Wis., Lang was for 25 years on the staff of Kimberly-Clark Corp. at mills in Niagara, Kimberly and Neenah, Wis. And prior to his association with Sumner Sollitt he served as a consultant to the U.S. Forest Products Laboratory, Crossett Paper Mills, Green Bay Paper & Pulp Co. and Improved Machinery Inc.

Eugene F. Duff

Eugene F. Duff, paper mill designer and draftsman, died in March at the age of 71. His home was in East Orange, N. J.

Duff, who was prominently associated with the design of mills throughout the United States and Canada, had been for the last 14 years chief draftsman for Roderick O'Donoghue & Co., New York, N. Y. engineering consultants. He had previously been associated with George F. Hardy Co.

Paul L. Swisher

Paul L. Swisher, a vice president and a director of Reichhold Chemicals Inc., died March 9 at his North Tarrytown, N. Y. home. He was 59.

Swisher was also director of sales and advertising for Reichhold. He became associated with the firm in Detroit in 1934.

Kenneth R. Brown, 61 retired vice president of Atlas Powder Co., died recently in West Chester, Pa. He retired in 1956 after 38 years of service, during which time he played a key role in the firm's entry into the chemical field.

Sheldon K. Towson, president of Elwell-Parker Electric Co., died in Cleveland recently after an illness of three months. He joined the company in 1927 and became president in 1942 on the death of his father, founder of the firm.

Austin L. Hawk, a sales executive for the Manhattan Rubber Div. of Raybestos-Manhattan Inc., died in March at the age of 47. He joined the division in 1929 as a clerk in the Chicago office and at the time of his death was manager of the central sales region.

G. Harris Collingwood, an official of the Library of Congress and former chief forester for the American Forestry Association, died early in April at his Washington, D.C. home. He was 67.

Benjamin E. Teale, 78, former superintendent for Crane & Co. at Dalton, Mass., died in March at his Clearwater, Fla. home. Prior to joining the Crane staff in 1939 he had been mill manager for Ancram Paper Mills in Ancram, N.Y. He had also been associated with E. D. Jones & Sons Co. and with Smith Paper Inc. of Lee, Mass. (now the Smith Paper Div. of Peter J. Schweitzer Inc.).

Richard Wojan, 74, until his retirement four years ago chief engineer for U.S. Paper Mills Corp., died recently in West DePere, Wis.

Russell E. Grey, field representative in the Penn-Jer-Del area for Lockport Felt Co., died April 16 at his home in Grahamsville, N. Y. He became associated with the firm in 1954, prior to which he had served as general manager of Gotham Paper Mills at Battensville, N. Y., and at one time was on the staff of Rondout Paper Mills Inc.

Burgess Smith, inventor of the check paper regarded as "the only true safety paper in the world", died April 14 at Rochester, N. Y. He was chief chemist for Todd Co. Inc. until his retirement in 1950.

Walter Ferris, 90, co-founder and vice president of Oilgear Co., died recently in Milwaukee. Ferris and the late E. K. Swigart founded the firm in 1921 to manufacture hydraulic transmissions.

NOW—CHECK ACCURACY WHILE YOU CHECK MOISTURE!

New Electronic Moisture Registers have first "built-in standard" in a 3-second, portable moisture tester.

NOW DIAL ACCURACY IS ASSURED, even under the extremes of production-line use. With *self-checking standard,* Moisture Register's new Model 5's are checked and adjusted for calibration accuracy right on the job—by any untrained operator. He simply fits electrode to standard. Then with new trimmer he sets dial for perfect alignment. Gives calibration adjustment *in the field.* You get practical accuracy down to 0% ... 3-second spot tests for moisture wherever your product may be. Portable, light weight, battery operated, new rugged construction with miniature tube. Factory-set to your needs.

For faster testing of—

- Paper Stock
- Paperboard
- Insulation boards
- Paper Bags
- Plastics

SEND FOR NEW TECHNICAL DATA and information on 2-week free trial.

ELECTRONIC MOISTURE REGISTER *Instruments*

Moisture Register Company, Dept. PI
P. O. Box 910, Alhambra, California
Please send data on new Model 5's.

We are testing _____

in moisture range from ____% to ____%

Firm _____

By _____ Title _____

Address _____

City _____ State _____

FOREIGN ABSTRACTS

Fig. 1

Experiences with modern Swedish barkers

Machines known as "Bark-lasse" and "Barkalet" are apparently limited to uses in the forest. The "Cambio" barker (Fig. 1) can also be applied in pulp mills provided the wood has been presteamed. This steaming process can be limited to 3 hrs. As a result there is no apparent decrease in pulp brightness, and there is a beneficial decrease in resin content. Barking wastes (i.e. loss of wood), power demands and the cost of machine installation are all relatively low. Applications are discussed in some detail.

Thirteen illustrations. Otto Wurz. *Das Papier* **11**, No 23/24 548-52 (1957). (in German with French and English summaries).

Birchwood and birch pulp extractives

The ether extractives of green birchwood (*Betula verrucosa*) were analyzed.

This mixture (2.25 per cent of the wood) contained relatively small amounts of free acids (5.9 per cent). The main components were neutral unsaponifiables and the esters of fatty acids. The former contained a sterol, which was not beta-sitosterol, together with some high-boiling oils. After the saponification of the ether extractives both saturated and unsaturated fatty acids were isolated. The principal saturated acids were stearic and palmitic (which comprised about 12 per cent of the saponified product). Small amounts of arachidic and behenic acids were also present. Of the unsaturated acids, linoleic acid was the main component, representing about 34 per cent. Sulfite pulp prepared from birch (with ether extracted) gave about 2.26 per cent extractives; of these 67 per cent was neutral matter, of which 42.9 per cent (based on the total extractives) was unsaponifiable; 31.2 per cent free acids were present, and their composition was quite similar to those obtained from the wood. However, much less linoleic acid was in the pulp.

The study was made in part because birch sulfite pulp gave rise to pitch troubles somewhat similar to those obtained with spruce sulfite pulps. However, these difficulties are manifested not in the actual manufacture of paper, but during the bleaching operation when pitch is sometimes deposited on the walls of the equipment causing specks in the bleached pulp. Methods of analysis are outlined, and infra-red spectra for the unknown sterol and for sitosterol are given.

Ten references, six tables and a flow chart are given. S. K. Kahila and A. Y. E. Rinne, *Paperi ja Puu* (Finland) **39**, 526-30 (1957). (In English.)

Microbiological utilization of spent sulfite liquor

Lactobacillus arabinosus rapidly degraded and fermented both hexose and pentoses sugars in the spent liquor, producing lactic acid.

When autolyzed and pasteurized bakers yeast was used as a source of protein, up to 138 millimoles of lactic acid per liter of liquor per day could be obtained. Furfural did not inhibit fermentation. Lime water, when added to the spent liquor to precipitate calcium sulfite, accelerated sugar degradation. Lactic acid could be separated in amounts of 95-98 per cent (of that formed) by using suitable ion-exchangers, but neither this nor any other hitherto suggested method of recovery met industrial requirements.

Techniques for determining lactic acid are discussed. Of several strains of *Clostridium, C. beijerinckii* was the most effective in fermenting spent liquor into butanol (plus acetone) or into isopropanol. By using as nutrients 0.5 per cent corn meal, 0.5 per cent pasteurized bakers yeast, 0.05 per cent ammonium hydrogen phosphate, 1 per cent sodium sulfate and 0.1 per cent calcium carbonate, up to 67 per cent of the reducing substances in the spent liquor could be fermented, and of this fermentation product 60 per cent was comprised of neutral solvents. So-called "heat shock" (i.e., 1-2 min. of boiling water, or pasteurization at 78° C for 10 min.) accelerated spore germination and increased sugar utilization by 6 per cent but did not change the proportion of fermentation products. If to one liter of unfermented spent liquor 50-75 millimoles of butyric acid were added, the yield of this acid was lowered, but the yield of butanol was doubled (to 45 millimoles per liter), and the yields of acetone and isopropanol were improved.

The addition of smaller amounts of butyric acid had little influence, large amounts inhibited the fermentation to neutral products. The addition of 75 millimoles acetic acid per liter greatly increased the production of butyric acid, slightly decreased the butanol yield and improved the yield of isopropanol and acetone. Thus, by chemical means, the proportion of neutral to acid fermentation can be regulated to a certain extent.

Peter Gfeller Ph.D. Dissertation (1954). Eidgenössische Tech. Hochschule, Zurich. 72 p. (in German). Through. *Bull. Inst. Paper Chem.* **28**, 643 (1958).

Permanganate number of pulps

The authors have suggested a standard procedure applicable to any pulp for determining the permanganate number. This is based, with modifications, on the Swedish "CCA 9 C" method in which the addition of chemicals, the total volume, the reaction time and the temperature are kept constant, whereas the amount of pulp added (in the modified procedure) is varied. The permanganate number is then defined as the $KMnO_4$ consumption (in ml. of 0.1 *N* permanganate) per gram of oven-dried pulp, when the pulp addition is so adjusted that 50 per cent of the added $KMnO_4$ remains unchanged after the reaction has been completed. However, for other excess permanganate additions (ranging from 30 to 70 per cent), a suitable correction may be applied. This correction can be made irrespective of the type of pulp examined and of the order of magnitude of the permanganate number.

Other factors in the determination, such as the addition of chemicals and the total volume required in the test, are discussed. In general the acidity should be high and the volume kept relatively low. Full details are given.

The modified technique was applied to various spruce, pine and birch sulfite pulps and to neutral semichemical sulfite pulps, to a large variety of pine kraft pulps, to two birch kraft and one birch soda pulp. In carrying out the reaction, the temperature was 25° C., the time of treatment 5 min. and the acidity of the order of 1.0 *N* acid. The total volume should be kept to 250 ml.

Eleven tables, three graphs and three references are given. Christian Valeur and Ivan Törngren. *Svensk Papperstidn.* **60**, No 22, 829-835 (1957) (in English).

HAM FELTZ asks:

"How much wool does it take to 'cover' a century?"

Mr. C. C. SHULER replies:

"IT ISN'T the quantity of wool
we've made into felts these past 100 years
—but the *quality*—that counts.

"And as we start into our second century
of making better felts,
I'm sure that my grandfather Asa Shuler
and his founding partner J. W. Benninghofen
would be as proud to guarantee the
felts we make today as they were in 1858.

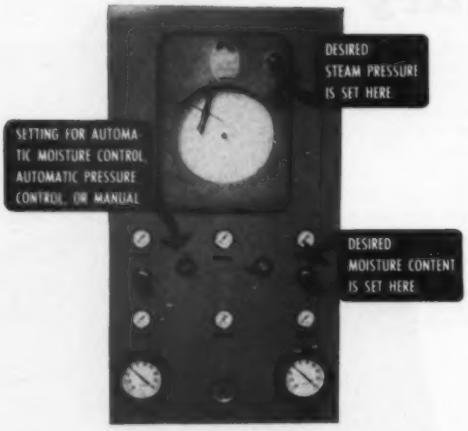
For Hamilton Felts are still made of as carefully
selected wools, as carefully loomed, joined
by hand and inspected as they were
in those early days of proud craftsmanship.
But, in addition, our present felts
have many technical improvements for the
faster removal of water and the making
of better board and paper at lower cost
than were ever dreamed of
even a few years ago.

"If one of our present 300 proven styles
won't solve your specific problem
we will be happy to
design a Hamilton Felt that will!
Just ask your Hamilton Felt Service Salesmen
—or write to us—today."

YOU CAN'T BEAT
Hamilton
FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

This moisture control works faster...needs less hand adjustment


DESIRED STEAM PRESSURE IS SET HERE
SETTING FOR AUTOMATIC MOISTURE CONTROL, AUTOMATIC PRESSURE CONTROL, OR MANUAL
DESIRED MOISTURE CONTENT IS SET HERE

Control panel of Stickle Pres-ten-trol automatic moisture control system houses controls and instruments for regulating, indicating and recording steam pressure in dryers and moisture variation in the sheet.

Only the improved Stickle automatic Pres-ten-trol moisture control system offers all these benefits . . .

1. Automatically maintains exact moisture content desired in any type paper or board within ½ of 1% guaranteed—regardless of machine speed.

2. Records or indicates moisture variation of sheet, steam pressure in dryers, time and duration of breaks.

3. Instantly regulates steam flow to dryers within preset limits. Violent fluctuations are eliminated by using both tension and pressure controls in dual operation.

4. Maintains desired steam pressure in dryers when paper is off the machine for start-up, wash-up, or wet end breaks. When break occurs, "electric eye" control shuts off steam or maintains steam pressure at preset level; restores proper moisture content up to 8 times faster than other controls.

5. Provides convenient adjustment and monitoring, with all controls and instruments located in one panel as shown above. No hydraulic pistons, chains, pulleys or weights.

6. Eliminates hand adjustment except where slight changes are desired for sharper control.

7. Reduces steam consumption because it admits only enough steam to maintain required moisture content.

Before you install any moisture control, get all the facts on Stickle's Pres-ten-trol. Write today for free Bulletin 360-C.

STICKLE STEAM SPECIALTIES COMPANY

2215 Valley Ave. • Indianapolis 18, Ind.

Moisture Control Systems
Dryer Drainage Systems
Feed Water Heaters
Vacuum Pumps
Micro Adjustable Orifices
Differential Control Valves

Stickle Equipment
Cuts the cost of steam

PATENT REVIEWS

MELVIN NORD*

Paper stock consistency regulation

U.S. 2,815,763, issued December 10, 1957, to John R. Fanselow and assigned to Kimberly-Clark Corp., relates to a method for automatically controlling the percentage of papermaking substances contained in stock used for making paper. According to the inventor, variations in the ream-weight of finished paper are generally attributable to variations in the paper stock consistency.

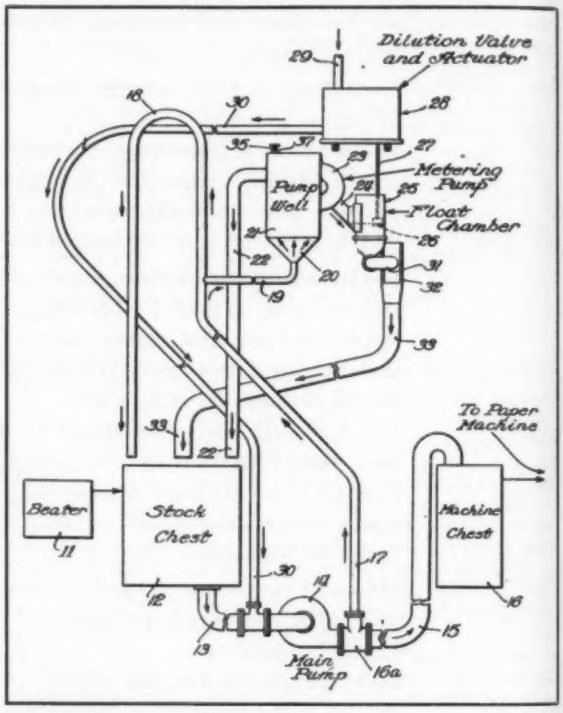


Fig. 1

In Fig. 1 the numeral 11 represents the beater which readies the furnish for delivery to the stock chest 12. The stock in this chest is normally at a higher consistency than is desired for supply to the machine chest of the paper machine and ordinarily must be diluted to a lower standard consistency. The stock after beating may have a consistency as high as 7 per cent, in which case it is customary to dilute to a consistency as low as 3 per cent in the stock chest 12 before it is delivered into the machine chest. It is customary to make a further dilution of a predetermined volume of the standardized stock with white water before it is delivered to the head box of the paper machine.

From the stock chest the main flow of stock passes through a pipe 13 to a pump 14 from which a pipe 15 delivers it to the machine chest 16. Located in the pipe 15 there is a T 16a which permits a certain portion of the main flow of stock from pump 14 to be bled off through a sampling line or bypass 17 which extends upwardly and terminates in an inverted U-tube, the top bend 18 of which is preferably located at a height of several feet above the regulating mechanism which will be later described. The lower end of this U-tube 18 is open and discharges directly into the stock chest. A branch line 19 connected to the bleed pipe 17 diverts a portion of the flow from pipe 17 into the lower end 20 of a pump well or vat 21 in which the stock is kept at sub-

*Patent attorney, 17600 Pinehurst, Detroit 21.

stantially constant level. The overflow passes off through a line 22 which also discharges into the stock chest 12.

From the pump well 21 a metering pump 23 delivers a sample of the stock at a uniform rate of flow through a pipe 24 and into the float chamber 25. The float chamber 25 has a float 26 connected by means of a float rod 27 to a mechanism for actuating a valve, indicated at 28, for controlling the flow of a supply of liquid of consistency differing from that of the main flow. When combined with the main flow of stock through pipe 13 the combined flow leaving the pump 14 will have reached the proper consistency. This controlled flow which is supplied through pipe 29 by suitable pressure is delivered through pipe 30 to the pipe 13 ahead of the pump 14 so that the two flows, one from the stock chest and one from the pipe 29, are combined and passed through the pump 14 before the sample is taken out through the pipe 17.

The pipe 29 is usually supplied with fresh water or with white water from the paper machine.

The depth of the sample of stock in the float chamber 25 is maintained at a substantially-constant level by reason of the fact that the flow of stock from the float chamber is limited by the amount which can flow out through the impedance tube 31 at the lower end. The impedance tube discharges freely into an open-sided box or housing 32, the lower end of which is connected to the upper end of a pipe 33 which also discharges into the stock chest 12.

The patent further describes the apparatus in considerable detail.

Treatment of waste sulfite liquors

U. S. 2,816,831, issued Dec. 17, 1957, to Harold O. Goddard, describes a process for the treatment of waste sulfite liquor.

Steam for use in the operation of a sulfite pulp plant is generated to a pressure higher than that required for the operation of the digesters and paper machine dryers, and at the higher pressure is used to concentrate the waste sulfite liquor into a form which is usable as a fuel in a steam generator.

The solids from the concentrated waste sulfite liquor, which contain approximately 8000 BTU per pound of dry solids, are produced in a finely divided state and may readily be substituted for pulverized coal to fire the steam generator. The steam, after use in concentrating and drying the waste sulfite liquor, is then used at its reduced pressure to operate the above-mentioned steam consumers of the sulfite pulp plant.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Open side multiple roll calender	Mc Kiernan-Terry Corp.	2,815,531	12/10/57
Bark-removing machines	Improved Machinery Inc.	2,815,776	"
Packing case for Pilsener glasses	Keyes Fibre Co.	2,815,857	"
Can carrying cartons	Saranac Machine Co.	2,815,857	"
Collapsible carton	Bloomer Bros. Co.	2,815,897	"
Stiffening panels for flexible walled containers	Bemis Bro. Bag. Co.	2,815,898	"
Apparatus for skiving the edges of a moving web of paper	Paper Research & Development Corp.	2,816,400	12/17/57
Pressure unit for box wrapping machines	Imperial Paper Box Corp.	2,816,491	"
Form block for box covering machines	Imperial Paper Box Corp.	2,816,492	"
Holder for cigars	Crescent Paper Box Factory Inc.	2,816,651	"
Shipping container for particulate solids	E. I. du Pont de Nemours & Co.	2,816,652	"
Combination label and hosiery protector and package	Industrial Lithographic Co. Inc.	2,816,653	"
Paper containers	Lily-Tulip Cup Corp.	2,816,697	"
Knock-down carton	William P. Frankenstein	2,816,698	"
Easy opening container	The Patent & Licensing Corp.	2,816,699	"
Bags for seeds	Arkell Safety Bag Co.	2,816,700	"
Plug expander unit for cardboard containers	Package Machinery Co.	2,817,202	12/24/57
Carton blank forming die	Floseal Corp.	2,817,273	"
Paper laminates	Monsanto Chemical Co.	2,817,386	"
Paper bags	Central States Paper & Bag Co.	2,817,474	"
Blank feeding apparatus	The Gardner Board & Carton Co.	2,817,517-8	"
Blank feeding apparatus	Atlanta Paper Co.	2,817,520	"
Perforation of paper for tea bags	Olin Mathieson Chemical Corp.	2,817,596	"

There are *many* features that set DeZurik Knife Gate Valves worlds apart from all others. Most important is their super-strength, the extra quality built into every DeZurik Gate Valve.

The gate is over-sized, made thicker to withstand greater pressure without buckling; welded-in ribbing binds both flanges into a sturdy structure eliminating distortion from piping strain.

Complete details in Bulletin 300. Write for it.

DeZURIK CORPORATION
SARTELL, MINNESOTA

For the big, tough jobs!...

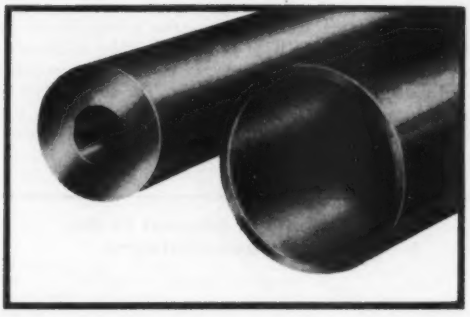
ACIPCO *CENTRIFUGALLY SPUN* STEEL TUBES

The Crompton & Knowles D-7 loom produces drier felts in full 360-inch widths for the paper industry.

Long rolls with unusual dynamic balance and dimensional stability were required for this new heavy-duty loom. In addition, the let-off and winder rolls must stand extremely heavy loading with minimum deflection and run-out.

Acipco furnished the 10″ and 12″ OD, Type 1045 steel tubes used for these rolls. Because they are centrifugally spun in the longer lengths necessary for today's machinery, versatile Acipco tubes possess the *inherent* qualities which Crompton & Knowles requires.

Acipco centrifugally spun tubes, produced in alloy steels and irons to meet all physical, chemical and metallurgical requirements, offer designers and manufacturers many additional advantages. If *your* problem is in a tubular metal part, find out more about Acipco. Your call or letter will bring complete information.



VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES . . .

are used in the manufacture of calender, engraving, press, slitter, rewinder, plate cylinder, squeeze and starch bath rolls as well as in hundreds of other industrial applications.

SIZE RANGE: Lengths up to 410″ to meet modern machinery requirements have been produced. OD's from 2.25″ to 50″; wall thicknesses from .25″ to 4″.

ANALYSES: All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel, and special non-standard analyses.

FURNISHED: As cast, rough machined, or finish machined, including honing. Complete welding and machine shop facilities.

SPECIAL PRODUCTS DIVISION

AMERICAN CAST IRON PIPE CO.

BIRMINGHAM 2, ALABAMA

NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Aluminum jacketing elbow

A new type of aluminum jacketing elbow that enables a limited number of units to cover most sizes of insulated piping is now distributed.

These "humped elbows" are made of heavier gauge aluminum than standard jacketing elbows. There are no metal folds, giving them a smooth, wrinkle-free appearance without the "stove pipe" look sometimes found in similar elbows. *Pittsburgh Corning Corp.*

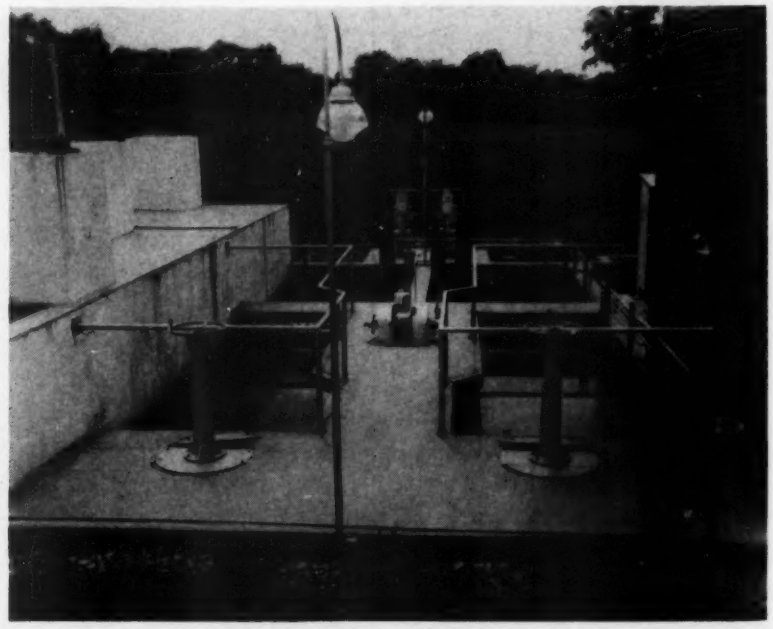
Circle No. 11 on Readers' Service Card

New face seal and bearing support

A new face seal and bearing support designed to provide installation and maintenance savings for immersed rolls, rotors and shafts has been introduced to the market. The units are particularly suitable for application under conditions found in paper and similar process industries.

The company reports that the unit acts as an effective and relatively frictionless seal against leakage, yet its design permits external mounting of shaft bearings. It is said to eliminate scoring and damage to costly shafts, which is frequently encountered when a stuffing box is used. *Rodney-Hunt Machine Co.*

Circle No. 12 on Readers' Service Card

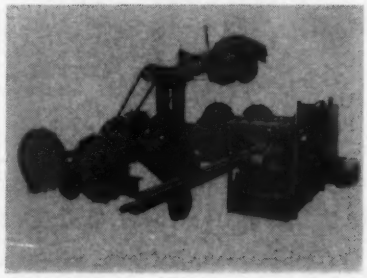


Uniflow settling tanks

Here is an improved design of the Uniflow settling tank which is used for removal of solids from water, sewage and industrial wastes.

The tank combines a rapid sloping bottom with multiple effluent weirs. The advance design is said to increase efficiency of solids removal, offer economical construction and maintain the velocity of liquid throughout the tank at as nearly uniform a rate as practical tank construction allows. *Link-Belt Co.*

Circle No. 13 on Readers' Service Card



Log barker

Pictured above is the new Baton log barker. Outstanding features claimed for this chain-flail-type barker are low price, extreme ruggedness, one-man operation and the debarking of logs of from 5 in. to 4 ft. in diameter with production of up to 30,000 bd. ft. per day.

Illustrated literature and complete details are available from *White River Machine Co.*

Circle No. 14 on Readers' Service Card

Epoxy-based sealer for use in emergency repairs

Emergency repairs of metals, plastics, wood, concrete and other materials are quickly made with a new product called Homalite 345, an epoxy-based compound.

The company has stated that the product has been used successfully as a lining for tanks and ducts handling fluid chemicals and other corrosive materials. It is unaffected by temperatures up to 150°F. Special formulations can be supplied to meet higher temperature conditions.

The Homalite 345 Kit is available for

MOST

COMPLETE STOCK OF

STAINLESS STEEL!

Never-before coverage and service! Only the new association between Power Stainless Products Co., Passaic, New Jersey, and Stainless Piping Supply, Inc., of Charleston, West Virginia, brings such complete and prompt service in corrosive-resistant materials. Now just one phone call to one source gets you everything you'll ever need in four major industrial areas! Write today on your company letterhead for your copy of the most complete catalog ever assembled within two covers.

STAINLESS STEEL PIPE • VALVES
TUBINGS • FITTINGS

Complete Line of Stainless Steel Fastenings

"Specialists in Corrosion Resistant Materials"

POWER
Stainless products co.

356 Harrison Street, Passaic, N. J. GRegory 3-2100

STAINLESS PIPING SUPPLY, INC.
1037 Pennsylvania Avenue, Charleston, W. Va.
Dickens 6-0547

New Products . . .

experimentation. It consists of four ½-pint packages, a roll of glass cloth, rubber gloves and a brush. *Homalite Corp.*

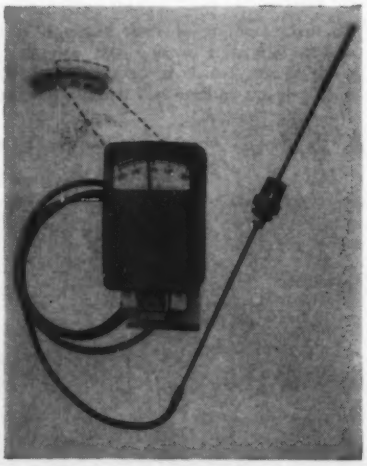
Circle No. 15 on Readers' Service Card

Vertical sump

Here is a vertically-designed, rubber-lined pump for sump and general pump-operation. The pump proper operates submerged below the level of the liquid in the sump.

Known as the Denver SRL-V, this pump is available in 2- × 2-in., 3- × 3-in., 5- × 5-in. and 6- × 6-in. sizes with capacities from 20 to 1400 gpm. *Denver Equipment Co.*

Circle No. 16 on Readers' Service Card



Indicating transmitter

Here is a compact indicating temperature transmitter for pneumatic transmission of temperature measurement in ranges from 100°-600° F with spans of 100° and 200° F.

With the upper, more sensitive portion of the conventional vapor pressure thermal curve expanded over a 4½-in. scale, this model provides as much as 30-50 per cent greater sensitivity. *Foxboro Co.*

Circle No. 17 on Readers' Service Card

Plastic roll covering

A new and unique process has made possible the use of rigid PVC for roll covering.

In a carefully controlled Luzerne process special PVC tubing is shrunk tightly over new or old rolls providing a strong mechanical bond.

This development has opened the way for numerous applications in the cellophane, film, textile, paper and process industries. *Luzerne Rubber Co.*

Circle No. 18 on Readers' Service Card

Technique for foaming adhesives

The development of a new technique for foaming adhesive has promises of opening new markets for the forest products industry.

Immediate applications lie in the manufacture of such products as plywood, particle board, decorative overlays, gummed paper, etc. Basic advantage of the technique is that it extends the volume of adhesives by four to five times and provides a more uniform spread, plus better bonding qualities with less adhesive. *Arthur D. Little Inc.*

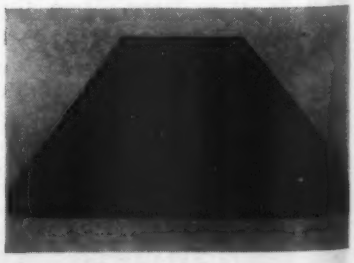
Circle No. 19 on Readers' Service Card

Heavy-duty control switch

Type 210 MD is a newly-designed heavy-duty control switch which is recommended for master switch service in processing plants.

The switches are said to feature long life and low maintenance and are available in countless combinations of handles. They are arranged for pulpit, benchboard, switchgear or control cabinet mounting. *Allis-Chalmers Mfg. Co.*

Circle No. 20 on Readers' Service Card

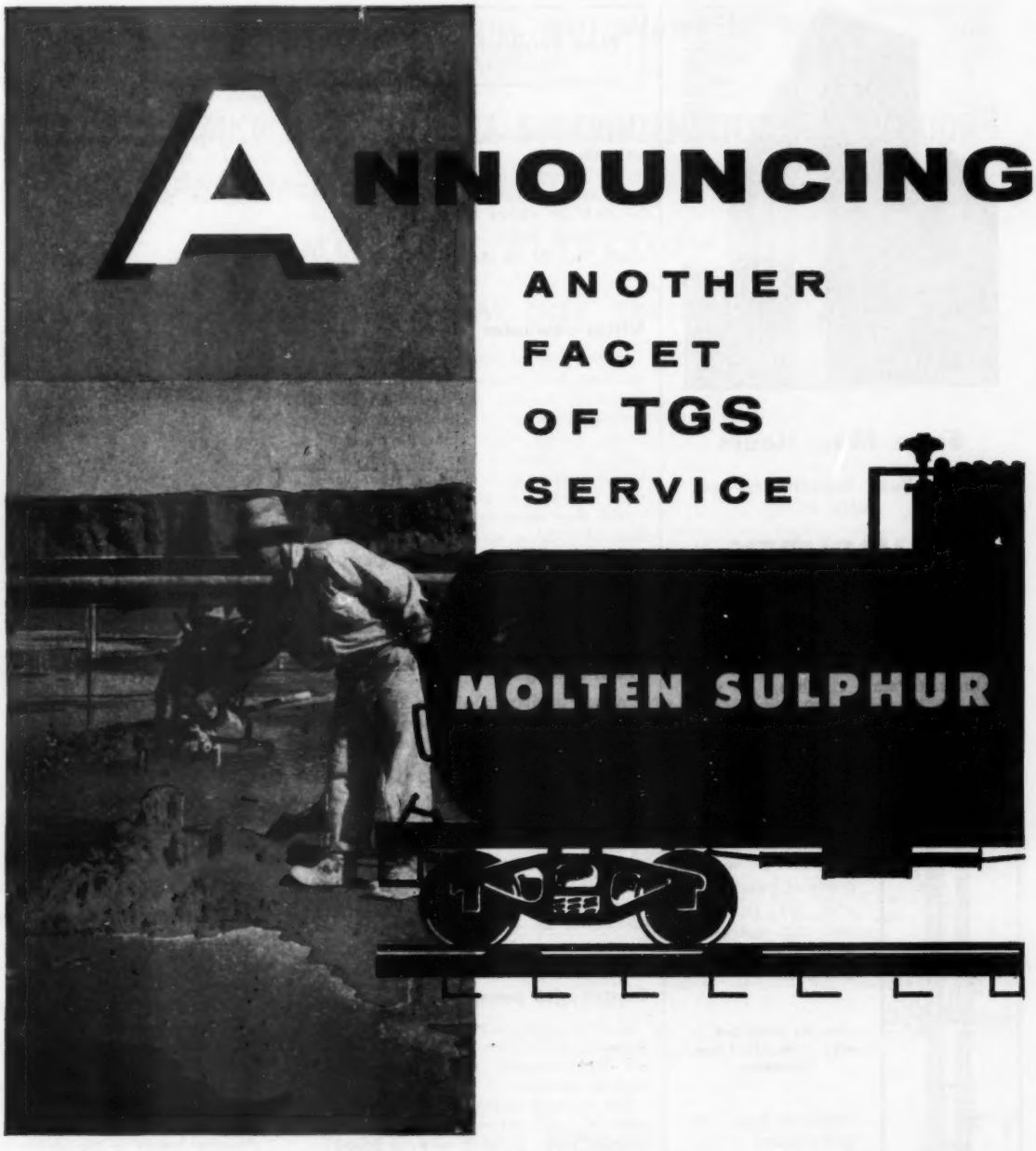


Hardwood conveyor apron

A new hardwood-slatted conveyor apron has been recently introduced to the in-

ANNOUNCING

ANOTHER FACET OF TGS SERVICE



We are now equipped to ship Molten Sulphur in tank car lots to any point in the United States or Canada.

Advantages? No contamination . . . no wind or water losses . . . cheap unloading . . . cheap melting cost . . . ready to use.

We shall be glad to discuss this new shipping service in connection with your requirements.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units — **Newgulf, Texas** · **Moss Bluff, Texas** · **Spindletop, Texas** · **Worland, Wyoming**

Save Man Hours

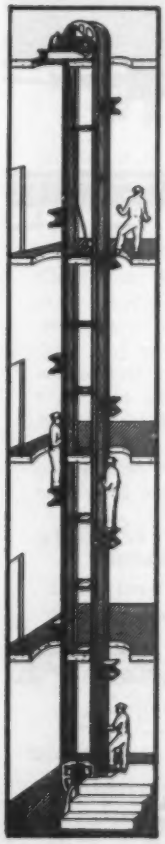
Equip Your Digester House with a

HUMPHREY

Employee's Manlift

ELEVATOR

Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.



Can be installed in any Multi-Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY

Inc.

344 1st Ave. N.W.

Faribault, Minnesota

Humphrey is the original Manlift Elevator, made continuously since 1887.

New Products . . .

dustry. The hardwood slats are mounted on leather belts.

The conveyor aprons can also be made using synthetic belts or chain. Aprons can be made in widths up to 14 ft. and in any lengths. *Robert A. Main & Sons Inc.*

Circle No. 21 on Readers' Service Card

Slitter-rewinder

A new line of slitter-rewinder machines has just been released. One outstanding feature of the new line is the Goebelette shearing principle. It employs throw-away cutting collars, which eliminate regrinding costs for bottom cutters and reduce the slitting inaccuracies resulting from variations in individual grindings.

The three standard models offer a range from 39½ in. to 63 in. in width and can handle all materials presently used in the converting field. *Cottrell Co.*

Circle No. 22 on Readers' Service Card

Front seal gum

A new product called Rapidex has been developed to fulfill the front seal gum needs of the new high-speed envelope machines. Its rapid drying and fast machining speed characteristics make it of great value to existing envelope equipment as well.

Rapidex is said to have excellent stability in the gum box and will flow to the rolls without pasting even after days of agitation. *Morningstar-Paisley Inc.*

Circle No. 23 on Readers' Service Card

Centrifugal pump

A small chemical pump-motor unit with capacities to 16 gpm and heads to 28 ft. has been designed for heavy-duty continuous operation.

The pump is ideally suited for handling acids in a dye vat machine or for use in recovery units, as well as pilot plant or laboratory applications. *Goulds Pumps Inc.*

Circle No. 24 on Readers' Service Card

Gate valve

An announcement has been made of the new OPW-Jordan No. 76 gate valve featuring 125-psi aluminum body and nylon seating discs. The nylon discs are said to afford exceptionally tight, lasting shut-off even in presence of dirt or grit. *OPW Corp., Jordan Industrial Sales Div.*

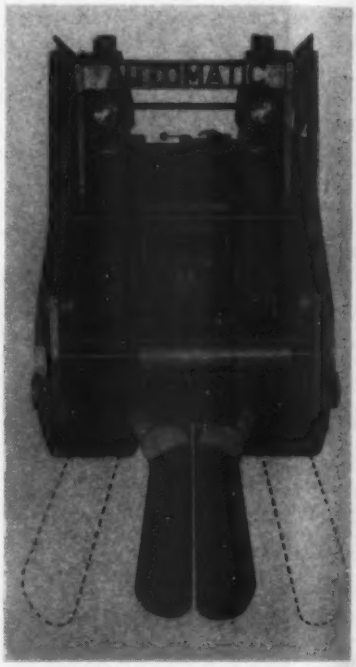
Circle No. 25 on Readers' Service Card

PVC fume scrubbers

A new PVC fume scrubber has been introduced to the industry. This scrubber is fabricated entirely of unplasticized polyvinyl chloride, a moulded plastic resin which offers exceptional resistance to the action of a large number of corrosive media.

A bulletin giving complete details on sizes, capacities and materials of construction for all fume scrubbers is available from *Schutte & Koerting Co.*

Circle No. 26 on Readers' Service Card



Side-shifting fork on fork truck

A newly-designed side-shifting fork and load-carrying ram arrangement has been incorporated in the manufacture of Automatic Transportation Co.'s Elbolift.

This hydraulically-controlled arrangement enables the operator by means of pushbuttons to side shift a load 4 in. to either side of the truck or to bring the forks together at the truck's center line to form a load-carrying ram.

Another benefit is the ability to adjust forks (hydraulically) individually or simultaneously to suit fork spread as required. Capacity of the truck is 12,000-20,000 lb. *Yale & Towne Mfg. Co., Automatic Transportation Co. Div.*

Circle No. 27 on Readers' Service Card

Machine for sealing paraffin-coated cartons

A machine making it possible to use cold glue for tightly sealing paraffin-coated cartons has been designed and built for the frozen food industry.

Called the Concora Sealer, the new machine combines easily with existing packaging line facilities, such as forming and loading machines.

The bonded seal and paraffin covering of the carton eliminate the need for the

THE CONVENTION YOU WILL *NOT* WANT TO MISS

39th Annual

THE AMERICAN PULP & PAPER MILL SUPERINTENDENTS ASSOCIATION

Hotel Statler, Boston, Mass. **June 3-5, 1958**

THEME: COST REDUCTION

HEADLINE SPEAKERS AND WHAT THEY ARE TO TALK ABOUT

Robert E. O'Connor, American Paper and Pulp Association, New York, N. Y. — Cost Reduction Trends Affect Economy of Pulp & Paper Industry

H. M. Gray, Sealright-Oswego Falls Corporation, Fulton, N. Y. — The Imperative Need For Cost Reduction

D. J. Dughie, Scott Paper Company, Chester, Pa. — Painless Cost Reduction

J. J. Ward, Union Bag-Camp Paper Corp., Savannah, Ga. — A Practical Approach to Maintenance Cost Reduction

Thomas E. Hoover, Kimberly Clark Corp., Neenah, Wis. — Foreman Education for Cost Reduction

D. Crossley, North Western Pulp & Power Ltd., Hinton, Alberta, Canada — Modern Forestry Management

B. P. Bunch and C. D. Coates, The Mead Corp., Chillicothe, Ohio — Control of Pitch in Sulphite Pulp

Dr. Nicholas J. Lardieri, National Council for Stream Improvement, New York, N. Y. — Air Pollution Control and Its Relation to the Pulp and Paper Industry

E. N. Wennberg, Weyerhaeuser Timber Co., Longview, Wash. — Cost Considerations in the Production of Bleached Fourdrinier Boards

Jack Wilber, St. Regis Paper Co., Deferiet, N. Y. — Paper and Board Coating — On or Off-Machine

Carl H. Swartz, Beloit Iron Works, Beloit, Wis. — Developments and Applications of the Suction Former

William Huggins, Detectron Inc., New Haven, Conn. — Instrumentation for Cost Reduction and Quality Control

Robert Hisey, S. D. Warren Co., Cumberland Mills, Maine — Refining of Hardwood Pulp

Cecil C. Parvin, Nekoosa-Edwards Paper Co., Port Edwards, Wis. —Cost Reduction in the Finishing Room

R. Carl Chandler, Standard Packaging Corp., New York, N. Y. — Cost Reduction's Greatest Aid is a Well-Planned Sales Program

Garland T. Edmonds, The Chesapeake Corp. of Virginia, West Point, Va. — Evaluation of Hot Press Installation

R. E. Phinney, Container Corporation of America, Fernandina Beach, Fla.; Garland T. Edmonds, The Chesapeake Corp. of Virginia, West Point, Va.; Anthony J. Parrino, Rome Kraft Co., Rome, Ga.; Richard Smith, Beloit Iron Works, Beloit, Wis.; Wesley Corbin, The Black-Clawson Co., Watertown, N. Y. — Comparative Analysis of Steam Consumption on High Speed Fourdrinier Machines (A Panel)

Frank Emerson, West Dudley Paper Co., West Dudley, Mass.; Henry W. Dauterman, Longview Fibre Co., Longview, Wash.; and M. B. Shirlaw, Hamilton Paper Co., Miquon, Pa. — Use of Rotabelts on Fourdrinier Machines (A Panel)

H. A. Black, The Mead Corporation, Chillicothe, Ohio — What are Pulp and Paper People Thinking

Ralph V. Metz, West Virginia Pulp & Paper Co., Covington, West Virginia — Reducing Costs Through an Effective Safety Program

Clarence B. Nickerson, Harvard University, Graduate School of Business Administration, Boston, Mass. — Cost Control — A Prerequisite for Cost Reduction

Alva Kindall, Harvard University, Graduate School of Business Administration, Boston, Mass. — Non-Financial Incentives of Productivity

"Production 5118", film by The Champion Paper & Fibre Company, Hamilton, Ohio. Introduction by: Ray Garrett

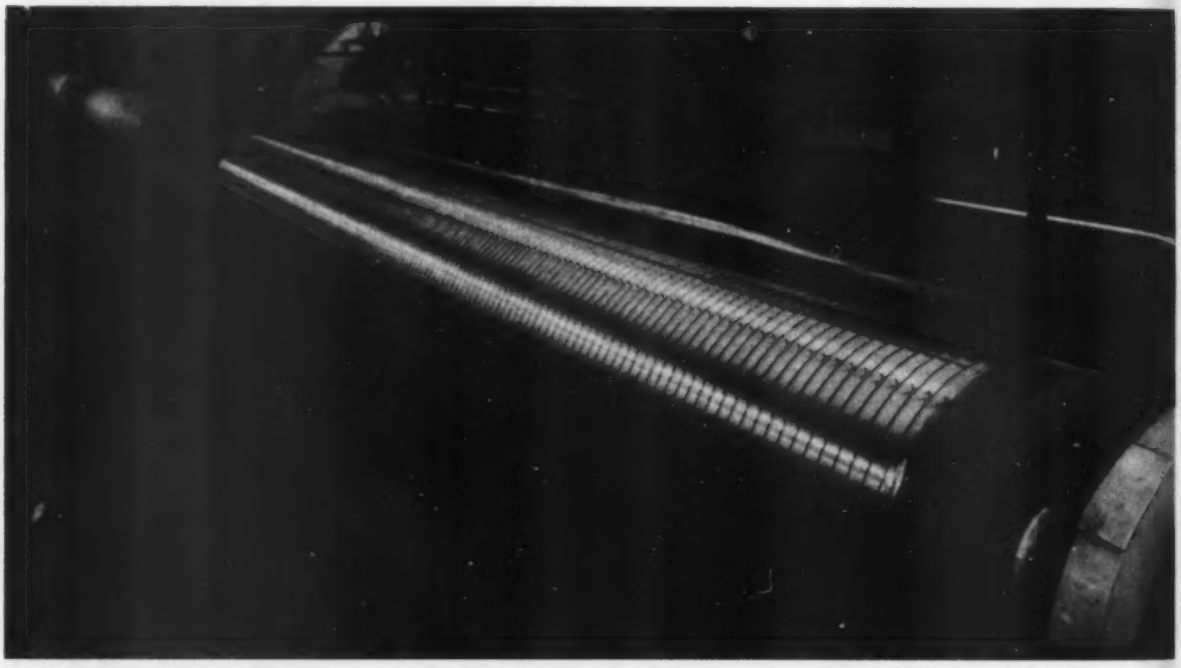
THERE IS STILL MORE:

Mill and Plant Visits — a breakfast, two luncheons, a banquet and dance — and a special program for the ladies

For more information, write, wire or phone: The American Pulp and Paper Mill Superintendents Association, 327 S. LaSalle St., Chicago 4, Ill. Telephone number — Webster 9-4743

THE CONVENTION YOU WILL REMEMBER

Ever see 20,000 miles of wire? Now you have – on this AWW loom . . . enough wire to reach nearly around the world. This is one of over 100 automatic Fourdrinier wire weaving looms – in a range of widths from 100″ to 340″ – which emphasizes our ability to fill your every wire need. Emphasizes, too, AWW leadership in meeting the changing requirements of the paper industry.



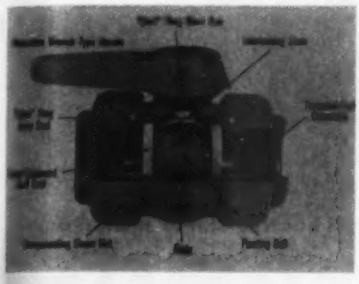
Now, new Mangaloy wires created by Appleton research for greater resistance to wear in certain applications. Ask your AWW representative for details. Appleton Wire Works, Inc. General Offices, Appleton, Wis. Plants at Appleton and Montgomery, Ala. International Wire Works, Menasha, Wis., an affiliated company.

APPLETON WIRES ARE GOOD WIRES

New Products . . .

traditional overwrap and at the same time provide enhanced product protection. *Container Corp. of America.*

Circle No. 28 on Readers' Service Card



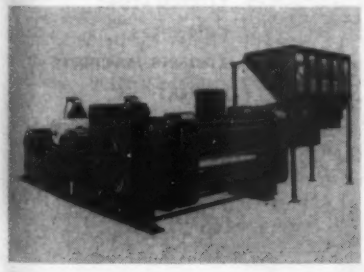
Self-lubricating ball valve

A new inexpensive rigid Koroseal PVC self-lubricating ball valve has been announced.

The company states that the quick-opening valve has no metal parts and will not rust or corrode.

Each valve is pressure tested to double-recommended working pressure in four conditions: closed-pressure on one end; closed-pressure on other end; closed-pressure on both ends and open-pressure on both ends. *B. F. Goodrich Co.*

Circle No. 29 on Readers' Service Card



Roll winder

An automatic toilet tissue and towel roll winder with recently-developed features is now being offered.

One of the many features in this unit is the new shear cut devices for clean-cut perforating of facial quality tissues. The company states that a continuous running through of the entire parent roll is better than 1200 fpm and without slow-down for cut-off. *Hudson Sharp Machine Co.*

Circle No. 30 on Readers' Service Card

Twin-throat venturi

A completely new venturi which produces higher differential pressure or lower head loss in a much shorter laying length than other types has been announced. Applications include metering of water, sewage, air and other fluids and gases. The venturi tube is available in a full range of sizes. *Infilco Inc.*

Circle No. 31 on Readers' Service Card

New 90° elbow spray nozzle

Because equipment often provides limited space for the installation of spray nozzles, a new line of spray nozzles with the body of the nozzle providing a 90° angle elbow turn has been developed.

Choice of spray angles is offered in the standard 65° angle type and wide angle 120° type. *Spraying Systems Co.*

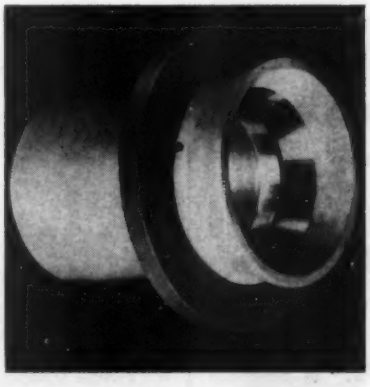
Circle No. 32 on Readers' Service Card

Replaceable metal bowl filters

New replaceable metal bowl filters are now being offered to improve filtering efficiency for ¾-in. and 1-in. air lines where temperatures reach 200°F and 300°F or where pressures go as high as 250 psi.

The new metal bowl models are furnished with either automatic or manual drain. *C. A. Norgren Co.*

Circle No. 33 on Readers' Service Card



Dall flow tube

A compact plastic insert-type Dall flow tube (model DFT-P1) is now being manufactured. It is made of epoxy or polyester resins, reinforced with fiberglas and with a corrosion-resistant metallic throat-ring and flange.

This flexible differential producer is ideal for metering ordinary liquids, gases and even such difficult fluids as acids, alkalis and slurries.

Standard models are available with a variety of metallic materials and for ph from 0.2-10. Temperature ranges are 60°-220°F. *BIF Industries, Inc., Builders-Providence Inc. Div.*

Circle No. 34 on Readers' Service Card

Gas scrubbing tower

Gas scrubbing towers capable of resisting highly-corrosive gases and extreme

FLIPPING the LINT OFF "FLIP-TOPS"

Jenkins' METLKOR Web Cleaning Brush of DuPont Tynex Nylon

The gravure production plant of the Downingtown Paper Box Company, Downingtown, Pennsylvania is an engineering triumph. Here, Marlboro "flip-tops" are produced on Champlain presses at speeds up to 2400 cartons per minute.

HERE'S WHAT THE DOWNINGTOWN PAPER BOX COMPANY SAYS: Mr. George J. Wolfer, Gravure Supt. says: "Jenkins' METLKOR brushes are contributing to the overall economy and quality that is so important to our production. When we reorder brushes, they will be Jenkins' METLKORS."

HERE'S WHAT THE MANUFACTURERS OF THE CHAMPLAIN INLINE GRAVURE EQUIPMENT, OF BLOOMFIELD, N. J., SAY: "The Jenkins' METLKOR brushes used in the web cleaning process of our Champlain inline gravure equipment are superior in performance and efficiency and are providing satisfactory and economical operation for our customers all over the world."

JENKINS' BRUSHES FOR PRINTERS

Dampener Roll Cleaning • Cylinder, hold down • Web Cleaning • Dusting • Removal of anti-offset powder • Feed. PAPER MILL BRUSHES: Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Feed or Carrier • Static Elimination • Flocking • Felt Cleaning • Paint Brushes • Floor Sweeps • Void Detector

Specify Jenkins' METLKOR the original . . . the best *Metal Core* brush

METLKOR®
CYLINDER BRUSHES
and **LIFEWOOD®** WOOD BACKED BRUSHES

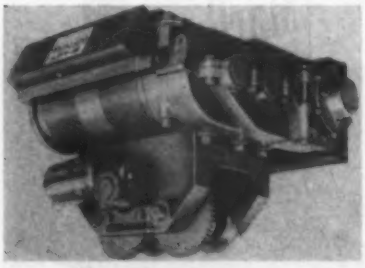
M. W. JENKINS' SONS, INC.
— Serving Industry for 80 Years —
542 Pompton Ave., Cedar Grove
Essex County, N. J. • CEnter 9-5150

New Products . . .

temperatures are now being fabricated completely from Duracor reinforced plastic for the chemical and metalworking industries.

In announcing this entirely new application, the company points out that Duracor was selected for the job because it offers a unique combination of high strength, design flexibility, easy workability and resistance to practically any corrosive gas, fume or liquid. *Ceilcote Co.*

Circle No. 35 on Readers' Service Card



New model hoist

All models of the Northern Hi-Lift hoist from 2-15 tons cap. are now available with a new inexpensive trolley drive designed for moderate speeds and for single or variable speed control. A worm drive provides smooth, quiet and trouble-free operation. These heavy-duty models have rugged features, and the compact design and arrangement allow maximum approaches with minimum space requirement. *Northern Engineering Works.*

Circle No. 36 on Readers' Service Card

Machine for fastening filled cartons

A new electric Clip-Top Packer Model T-E machine has been introduced. This machine fastens filled cartons electrically with king-size clips.

The unit is built for rough, rugged and rapid performance. It drives and clinches one clip each time the box flap makes contact, then is instantly ready to drive the next clip. *Container Stapling Corp.*

Circle No. 37 on Readers' Service Card

Boilers burn new-type "char"

The development of boilers capable of generating steam efficiently by burning a new-type low-volatile "char" has been announced.

Test burning of this fine, coke-like residue has been carried on with highly favorable results for nearly two years, states the company.

Three units that are currently being installed will have a design pressure of 2400 lb. psi and steam and reheat steam temperatures of 1050° each. *Babcock & Wilcox Co.*

Circle No. 38 on Readers' Service Card

Full bearing single suction pump

A full ball bearing single suction pump known as the Buffalo has an improved bearing structure feature. This feature is an enlarged "open bowl" frame which makes it easier to repack. These pumps are now in service in the chemical industry and in paper mills.

By increasing the space between the shaft and the bearing base and enlarging the open area at packing openings, repacking time is reduced and the operation is simplified. *Buffalo Forge Co., Buffalo Pump Div.*

Circle No. 39 on Readers' Service Card

ROGERS

KNIFE GRINDERS

HEAVY DUTY SERIES 220

Pictured is standard 210" Model 220 equipped with 15 HP Motor and 20" Segmental Grinding Wheel.

Rogers Heavy Duty Model 220 Grinder furnished in sizes from 78" to 240" with mechanical or hydraulic drive. Grinding Heads from 10 HP to 40 HP with segmental grinding wheels from 16" to 30" diam. Rogers Grinders have guaranteed built-in accuracy to produce the best grinding results. Many models and sizes from which to choose. Write for complete information.

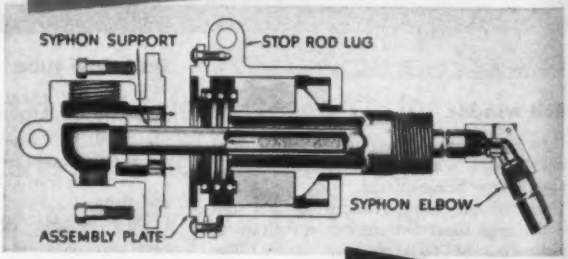
SINCE 1887

SAMUEL C. ROGERS & CO., INC.

2070 SHERIDAN DRIVE • BUFFALO 23, NEW YORK

The right rotary joint for every need!

- ON PAPER MACHINE DRYERS
- CORRUGATORS
- CALENDERS
- ROOFING MACHINES
- WAXERS
- EMBOSSERS
- PRINTING PRESSES



Type "SBP" shown is completely self-supporting. Like all Johnson Joints it has no packing, needs no lubrication or adjustment. The syphon elbow replaces unwieldy curved condensate drainage pipes with two straight pipes, hinges to pass right through the joint. Write for Bulletin S-3002. Johnson Rotary Pressure Joints are available for all operating speeds, pressures, mountings.

Johnson ROTARY PRESSURE Joints

First in the Paper Industry

THE JOHNSON CORPORATION

845 Wood St., Three Rivers, Mich.

NEW LITERATURE

Books

PACKAGING ANNUAL CATALOGUE & DIRECTORY OF GREAT BRITAIN. Published by Tudor Press Ltd., Tudor House, 75 Carter Lane, London, EC 4. Price: $2.50.

This is the 1958 edition of the Packaging catalogue. A new format has been introduced in this volume for the convenience of the reader.

The directory sections are now divided into four parts: Materials and Supplies, Containers, Machinery and Equipment and Services. A directory of trade names is also included.

BIBLIOGRAPHY OF PAPERMAKING AND U.S. PATENTS 1955-1956. Published by TAPPI, 155 E. 44th St., New York, N.Y. Compiled by Jack Weiner, chairman, Committee on Bibliography, TAPPI.

This volume contains the literature on pulp and paper manufacture published during the year 1956 and the United States patents of interest to the pulp and paper industry issued during 1955 and 1956. Periodicals and patents received at the library of The Institute of Paper Chemistry have been available for compilation of the bibliography.

This bibliography has been prepared by virtue of an arrangement between the Technical Association of the Pulp and Paper Industry and The Institute of Paper Chemistry.

Booklets and Pamphlets

PAPER TRADE TERMS. Prepared by William Bond Wheelwright. A new and enlarged edition of this booklet is now available. The number of definitions has been increased to include new terms and to cover a more complete vocabulary of the paper trade.

It is a handy pocket-size booklet (3⅜ x 5½ in.) bound in a sturdy cover and has been found very useful for quick, handy reference.

The list price of the booklet is 75c per copy postpaid and is available from Silton Bros. Gallaway Inc., 420 Boylston St., Boston 16, Mass.

PAPER . . . . THE FIFTH WONDER. By John H. Ainsworth. A series of 12 booklets has been published which portrays the paper picture in simple language that anyone can understand.

Each booklet is devoted to a specific phase of pulp and paper processing and can be used as a series of "lectures in print" or as a reference.

This series can handle many jobs in public relations, as an aid for salesmen and also a very useful training aid within the plant.

The booklets can be ordered individually (one chapter) at 15c per copy, or the complete set of 12 at $1.80. They are also available with the complete series of 12 chapters bound into a single, hard-bound volume at the price of $4.00. Each booklet measures 5 x 7 in. in size and contains 16 pages.

A free brochure giving an excellant description of each booklet, a special price schedule and other information on this series is available from Thomas Publishing Co., 724 Denoyer St., Kaukauna, Wis.

USDA Reports

MARKING GUIDES FOR NORTHERN HARDWOODS UNDER THE SELECTION SYSTEM. By Carl Arbogast Jr. The purpose of this report is to provide a working tool for marking timber stands under the selection system of management in the all-aged northern hardwood forest of the Lake States. Stand conditions are described, and marking guides are given not only for properly-regulated stands but also for irregular or unmanaged stands whose owner wishes to develop the conditions recommended for a productive forest. Copies of this report are available from M. B. Dickerman, Director, Lake States Forest Experiment Station, St. Paul 1, Minn. Ask for station paper No. 56.

SILVICAL CHARACTERISTICS OF FLOWERING DOGWOOD. Flowering dogwood is sometimes called cornel or boxwood. This report by John P. Vimmerstedt of Southern Appalachian Research Center gives the silvical characteristics of this species. Copies of this report are available from Joseph F. Pechanec, Director, Southeastern Forest Experiment Station, Asheville, N. C.

TEN YEARS OF EXPERIMENTAL FARM WOODLAND MANAGEMENT IN THE SOUTHERN APPALACHIANS. Farm woodlands account for about 40 per cent of the total woodland area of the southern Appalachians. With proper care

NOW IN SECOND PRINTING

PAPER AND PAPERBOARD MAKING

BY HARRY WILLIAMSON
Consulting Engineer and Author of
LESSONS IN PAPER MAKING

Pocket size, cloth bound text book of 372 pages covering all phases of stock preparation and sheet formation including the fundamental principles of making paper on the fourdrinier machine and paperboard on the multiple cylinder machine. Filled with practical papermaking know-how, this now widely-read book can be useful to the practical papermaker, technologist, and executive.

Price $6.00 prepaid with order

Published by
FRITZ PUBLICATIONS, INC.,
431 So. Dearborn Street, Chicago 5, Illinois

The Paper Industry
Professional and Business Services

Pulp and Paper Specialists
CALKIN & BAYLEY, INC.
Industrial Consultants
50 East 41st St., New York 17, N. Y.
Lexington 2-1956

they could supply an important part of the forest product needs of the region and at the same time provide a sizable supplement to the cash farm income. Few such properties are now operating at top capacity in either respect. This report by Robert A. Campbell of the Southern Appalachian Research Center gives a report of the 10-year experimental program in this area. Copies of this report are available from Joseph F. Pechanec, Director, Southeastern Forest Experiment Station, Asheville, N. C.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Booklet describes 24 basic chemicals

Olin Mathieson Chemical Corp. has issued a 16-page booklet describing the characteristics, grades and containers for 24 basic chemicals used by the industry. The booklet contains information on organic, inorganic and specialty chemicals produced by the company.

Circle No. 40 on Readers' Service Card

Pressure reducing valves

Jordan Corp. is offering a bulletin giving complete information on the OPW-Jordan sliding gate pressure reducing valves. Flow capacity charts, dimensional drawings, control ranges and material specifications are all given in the bulletin.

Circle No. 41 on Readers' Service Card

Corrosive-resistant materials

Power Stainless Products Co. and Stainless Piping Supply Inc. are now offering the first all-inclusive, hard-covered and bound catalog published exclusively on a complete line of corrosion-resistant materials. It is offered free to chemical, paper pulp, construction, refining and other specialized fields handling corrosive products. Copies are available by writing on company letterhead.

Circle No. 42 on Readers' Service Card

Control package

Barber-Colman Co. has released a data sheet describing a new control package designed for use with electric heat classroom type unit ventilators. The package consists of a duel element thermostat which provides control of both room and discharge air, an electric motor operator to position heater control switches, outdoor and return air dampers to provide standard ASHAE unit ventilator control cycle Y and a step controller for control of heaters.

Circle No. 43 on Readers' Service Card

Uniflow feeder

Sprout, Waldon & Co. Inc. is releasing a new bulletin describing a variable speed uniflow feeder that has a specially-designed combination screw and paddle conveyor arrangement that is said to provide maximum efficiency.

Circle No. 44 on Readers' Service Card

Twin-throat venturi

Infilco Inc. describes the company's Twin-throat venturi in a 20-page bulletin. Description, graphs and technical information are included.

Circle No. 45 on Readers' Service Card

Weather-protected motors

Allis-Chalmers Mfg. Co. features the type FOD weather-protected motor in a new bulletin just published. These motors are particularly suited for electric utilities, water works, pipelines, paper mills and chemical industries.

Circle No. 46 on Readers' Service Card

Separatory funnels

Fischer & Porter Co. is offering a 2-page flyer giving prices of three funnel types. Types covered are: funnels with regular delivery tips, with ground joint tips and with pressure equalizing lines.

Circle No. 47 on Readers' Service Card

Mill regulator

Reliance Electric & Engineering Co. A new bulletin describes the dual-circuit Reliance VSMR Mill Regulator designed and built by the company. The new electronic regulator unit provides precise regulation of line speed, voltage and tension for all continuous-process industries.

Circle No. 48 on Readers' Service Card

Plastics

Bakelite Co. is now issuing the 1958 edition of the Condensed Reference File that describes in easy, readable terms the major families of plastics produced by the company. The booklet gives data on polyethylenes, vinyls, styrenes, phenolics and epoxies.

Circle No. 49 on Readers' Service Card

Laboratory refiners

Sprout, Waldron & Co. Inc. has revised a technical and descriptive bulletin on laboratory refiners. Installation and close-up photographs as well as dimensional drawings are used to present these refiners. The bulletin also covers three methods for feeding these 12-in. units.

Circle No. 50 on Readers' Service Card

Safety-relief valves

Farris Engineering Corp. has published a new catalog describing the company's line of relief valves. The purpose of the catalog is to give the reader current detailed information for the ready selection and sizing of all the company's process safety-relief valves in one book. Cut-away photos are given for each valve which label each part of the valve. The company welcomes your request for this new catalog.

Circle No. 51 on Readers' Service Card

Industrial pH equipment

Beckman Process Instruments Div. announces the availablity of a new eight-page brochure that gives detailed descriptions and specifications for all industrial pH equipment offered by the company.

Circle No. 52 on Readers' Service Card

O-R-P cell and potentiometer-type recorder

Fischer & Porter Co. is offering a catalog describing the O-R-P cell and potentiometer-type recorder for measuring, indicating and recording oxidation-reduction potential. Electric, electronic or pneumatic control function may be added for automatic control of batch or continuous processes.

Circle No. 53 on Readers' Service Card

Automation and remote control of chemical feeders

Omega Machine Co. Div., Builders Iron Foundry Industries Inc. A number of methods of automatically controlling the concentration of chemical additives are in current use in industrial and municipal installations. Such systems are discussed in an eight-page bulletin now being offered by the company.

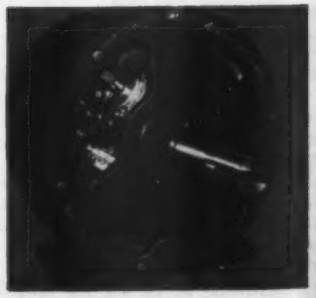
Circle No. 54 on Readers' Service Card

STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA



CLASSIFIED ADVERTISING

CONFIDENTIAL EMPLOYMENT SERVICE

For employers seeking new personnel and mill executives seeking new positions. We invite your inquiry.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington Street LIberty 2-6547 Boston 8, Mass.

WANTED: One 5000KVA, 57Kv Delta 2300 Delta, 3 phase 60 cycle, oil filled air cooled transformer, with 2-2½ tap above and below. 7.27% Z. provision for future fans desirable. Reply to box 665, The Paper Industry.

PAPER MILL RESEARCH CHEMIST

Unusual record of successful developments in boxboard, laminated, corrugated and specialty papers, desires position in charge of laboratory for well established independent mill. Experienced in quality control and direction of personnel. This is your opportunity to hire a man of recognized ability at very reasonable salary. Write Box 666, The Paper Industry.

MANAGER QUALITY CONTROL

Growing, multi-plant manufacturer in Chicago area needs young chemist or chemical engineer to develop and manage its quality control activities. Applicants should have quality control, research and development or process engineering experience in either paper making or special coating of paper such as photosensitizing. Replies will be screened confidentially by consultant. Send complete resume to Box 667, The Paper Industry.

TECHNOLOGY OF PAPER COATING
by H. Witcoff and A. W. J. Dyck
Price $2.00 prepaid with order
Published by FRITZ PUBLICATIONS INC.
431 South Dearborn Street, Chicago 5, Illinois

1958 PULP and PAPER MAP

NOW AVAILABLE

New wall-size map of the pulp and paper industry of the United States; size 42" X 58" printed in black and two colors, containing an indexed list of all active pulp and paper mills in the United States showing their products and daily capacities in tons.

Price: $7.00 prepaid with order

Published by
FRITZ PUBLICATIONS, INC.
431 South Dearborn Street
Chicago 5, Illinois

Highest Screening Capacity

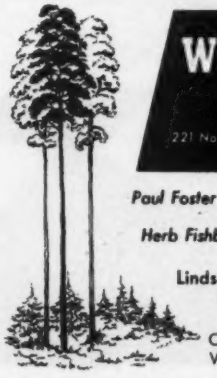
With their improved SLOT DESIGN **Fitchburg NEW TYPE-DUPLEX SLOT** Screen Plates have proven the HIGHEST CAPACITY plates made.

They are nearest to "self-cleaning" due to the special design milled slots. Require LESS "wash-ups." Maintain highest capacity all day—every day.

Give you up to ⅓ more screened stock: Pulp, Paper or Board.

FITCHBURG
Screen Plate Co., Inc.
301 South St., Fitchburg, Mass.

Cast Bronze
Plain or
Chrome Plated



WILLIAMS-GRAY COMPANY
221 North LaSalle Street, Chicago 1, Illinois

Paul Foster • Peter Talbot • Ross Lawrence
Herb Fishburn • Wes Gallup • Bill French

Lindsay & Niagara Wires
Knox Woolen Felts
Mount Vernon Dryer Felts
Carrier Rope, Splicing Tissues, Deckle
Webbing, Apron Cloth, Wire Brushes

The Trade-Mark of
DEPENDABLE
FELTS
The
WATERBURY Felt Company
SKANEATELES FALLS, N. Y.

The lighter side of paper . . . when it's a matter of whiteness, brightness and opacity . . . is best provided by TITANOX* titanium dioxide white pigments: number one choice in white pigments among paper makers.

Regardless of paper product—from bible paper to building board; regardless of purpose—from brand identification in food wrappers to easy legibility in printing papers . . . there's a TITANOX pigment for best results: TITANOX-AWD, TITANOX-C-50, or TITANOX-RA-50. In addition, TITANOX pigments will lighten the burden of processing, through their ease of dispersion and uniformity of all properties. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities.

5722

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	.60—	.65
No. 2 roofing (Chicago)	.40—	.45
Twos and blues, repacked	1.50—	1.75
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

New dark cuttings, New mixed cuttings, New light silesias, Light flannelettes, Unbleached cuttings, New white cuttings, New light oxfords, New light prints — Nominal

Old Rags

per cwt.

No. 1 white linens, No. 2 white linens, No. 3 white linens, No. 4 white linens, No. 1 white cottons, No. 2 white cottons, No. 3 white cottons, No. 4 white cottons, Extra light prints, Ordinary light prints, Medium light prints, Dutch blue cottons, French blue cottons, French blue linens, Checks and blues, Linsey garments, Dark cottons, Old shopperies — Nominal

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	4.75—	5.00
Gunny No. 1, foreign	4.50—	5.00
No. 1 manila rope, domestic	6.00—	7.00
No. 1 manila rope, foreign	5.00—	6.00
New burlap cuts (soft)	6.00—	6.50
Sisal strings	—	
Mixed strings	—	

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	100.00—	110.00
No. 1 hard white shavings	80.00—	85.00
No. 1 soft white shavings	45.00—	50.00
Soft white shavings, uncoated	55.00—	65.00
Fly leaf shavings No. 1	17.00—	22.00
Fly leaf, woody, No. 1	17.00—	22.00
Mixed colored shavings	18.00—	20.00
No. 1 books and magazines	13.00—	14.00
Ledger stock, white, No. 1	40.00—	42.50
Ledger stock colored, No. 1 (Midwest ship)	25.00—	
New manila envelope cuttings (free of groundwood)	60.00—	65.00
New manila envelope cuttings (containing groundwood)	50.00—	55.00
Manila tab cards	60.00—	65.00
Colored tab cards	45.00—	55.00
New northern kraft envelope cuttings	60.00—	65.00
Triple sorted kraft, 100%	25.00—	30.00
No. 1 old kraft	25.00—	
White news cuts, No. 1	45.00—	50.00
No. 1 overissue news	14.00—	16.00
Folded news, special	12.00—	13.00
Folded news, ordinary	10.00—	11.00
Old corrugated boxes	19.00—	20.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	9.00—	11.00
Boxboard cuttings	6.00—	7.00
No. 1 mixed paper	3.00—	4.00

CHEMICALS

F.o.b. New York City

Alum, ammonium		
Granular, bags, works, cwt.	4.30—	
Lump, drums, works, cwt.	5.05—	
Powdered, drums, works, cwt.	5.20—	
1-Arginine, drums, kilo	74.80—	
Blanc Fixe		
Direct process, bags, c.l., works, ton	115.00—	
L. c. l., ton	125.00—	
Bleaching Powder, drums, cwt.	—	
Casein, domestic acid precipitated		
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—	
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—	
China Clay, domestic dry-ground, airfloat, 99%		
325-mesh bags, c.l., Georgia works, ton	10.00—	12.00
300-mesh bags, c.l., Georgia works, ton	13.50—	14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00—	.35.00
Chlorine, liquid		
Tanks, single units, works, freight equaled, cwt.	3.15—	
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.29⅜—	
Litharge, commercial powdered		
Barrels, c. l., works, freight equaled lb.	.14¾—	
Rosin, gum, c. l., f.o.b. New York, cwt.		
K, M	9.05—	
N	9.20—	
WG	9.70—	
WW	9.80—	
Rosin, wood, c. l., f.o.b., shipping point, cwt.		
K, M.	7.80—	
N	7.90—	
WG	8.25—	
WW	8.50—	
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—	
Soda Ash		
Dense, 58%, paper bags, c.l. works, cwt	1.90—	
Light, 58%, paper bags, c.l. works, cwt	1.85—	
Soda, caustic		
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—	
Solid, 76%, drums, c. l. works, cwt.	4.80—	
Sodium Silicate		
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—	
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—	
Starch		
Pearl, 140-lb. bags, cwt.	7.53—	
Pearl, 100-lb. bags, cwt.	7.38—	
Powdered, 100-lb. paper bags, cwt.	7.50—	
Sulfur, crude		
Bulk, c. l. mine, contract, long ton	23.50—	
Talc		
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—	
Canadian, ground, bags, c. l. works, ton	20.00—	35.00
Titanium Pigment		
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—	
High-tinting, drums, c. l., lb.	.14⅜—	
Zinc Oxide Pigment, American process		
Lead-free, bags, c. l. freight allowed, lb.	.14½—	
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—	

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—
Groundwood, dom.	82.50— 90.00

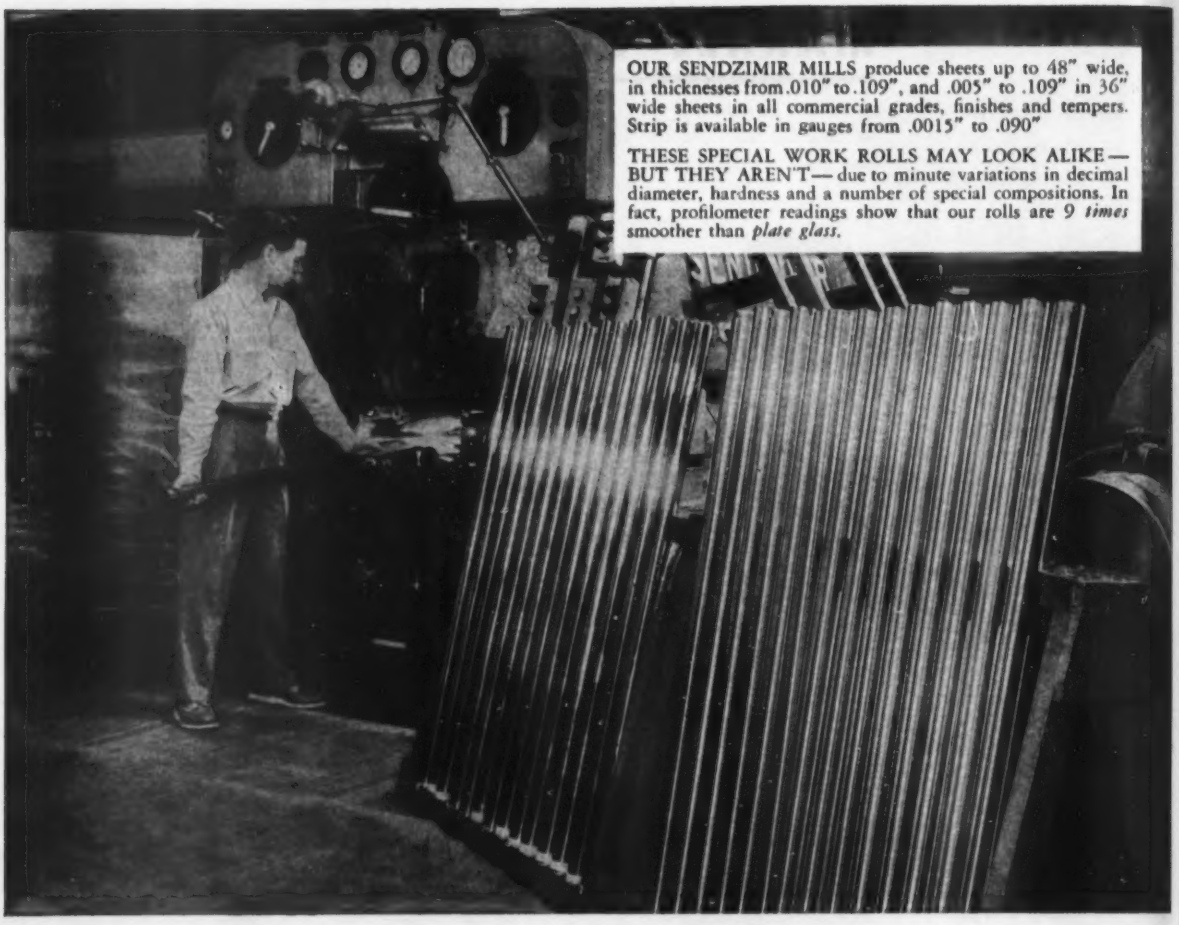
Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	64.70
75% "	49.65
50% "	37.80
25% "	31.90
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	65.85
75% "	50.80
50% "	39.00
25% "	33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.50
60-lb.	8.75
50-lb.	9.00
40-lb.	9.25
35-lb.	9.75
30-lb.	10.50
25-lb.	11.25
20-lb.	12.25
Leatherneck No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.00
(Sheets — Plus 50c cwt)	



OUR SENDZIMIR MILLS produce sheets up to 48" wide, in thicknesses from .010" to .109", and .005" to .109" in 36" wide sheets in all commercial grades, finishes and tempers. Strip is available in gauges from .0015" to .090"

THESE SPECIAL WORK ROLLS MAY LOOK ALIKE— BUT THEY AREN'T— due to minute variations in decimal diameter, hardness and a number of special compositions. In fact, profilometer readings show that our rolls are *9 times* smoother than *plate glass.*

It takes more than just a precision mill to produce STAINLESS STEEL *of MicroRold® quality*

...It takes Operating Know-How. Only Washington Steel, first to use Sendzimir sheet rolling, can offer you 10 years of practical experience with these mills.

Every hot-rolled stainless steel band has variations in thickness and surface characteristics which must be compensated for in the cold-reduction process to obtain precise gauge and flawless surfaces. To do this, special work rolls with minute diameter differences along the length of the roll are used in controlling such variations as crown, edge and camber. To accurately control all the possible variations requires a large number of these rolls, plus *highly skilled operators* who know from experience which rolls, speeds and reductions are required. These are but a few of important factors in quality rolling which can only be learned by *long* experience and association with precision mills.

Washington Steel is the only producer whose entire production stainless steel sheet and strip is rolled exclusively on the Sendzimir Mill.

WASHINGTON STEEL CORPORATION

5-GG Woodland Avenue • Washington, Pennsylvania

Index to Advertisers

Acme Steel Company 116
Adell Chemical Company .....
Albany Felt Company .....
American Cast Iron Pipe Co. .....
American Cyanamid Co. .....
American Defibrator, Inc. .....
American Industrial Clays, Inc. .....
American Paper & Pulp Co., Inc. .....
American SF Products, Inc. .....
American Pulp & Paper Mill Superintendents Association 131
Anheuser-Busch, Inc. .....
Antara Chemicals 101
Appleton Machine Co., The .....
Appleton Wire Works, Inc. 132
Appleton Wood Products Co. 141
Appleton Woolen Mills .....
Arrow Tank Co., Inc. .....
Asten-Hill Mfg. Co. .....
Atkins Saw Division .....

Bahnson Company, The .....
Bauer Bros. Co., The 106
Beloit Iron Works .....
Bird Machine Company 102
Black-Clawson Company, The .....
Bowsher Co., The N. P. .....
Burgess-Manning Company .....

Cameron Machine Co. .....
Carthage Machine Co. .....
Chemipulp Process, Inc. .....
Chicago Bridge & Iron Company 80
Clarage Fan Company .....
Clark & Vicario Corp. .....
Classified Advertising 137
Clinton Corn Processing Co. .....
Corn Products Refining Co. .....

Darling & Company .....
Dempster Brothers 85
DeZurik Corporation 125
Draper Brothers Company 114
DuBois Co., Inc., The .....

Eastwood-Nealley Corporation .....
Egan & Company, Frank W. .....
Electric Eye Equipment Co. 84
English China Clays Sales Corp. 114

Fisher Governor Co. 81
Fitchburg Screen Plate Co., Inc. 137
Fritz Publications, Inc. 135, 137

General Chemical Division .....
General Dyestuff Company .....
General Mills, Inc. .....
Georgia Kaolin Company .....

Hanchett Manufacturing Co. .....
Hills-McCanna Company .....
Horton Manufacturing Co., Inc. 136
Hubinger Company, The 120
Humphrey Elevator Company 130
Huyck Felt Co. 119

Illinois Gear & Machine Company 83
Improved Machinery, Inc. 82
Ingersoll-Rand .....

Jeffrey Manufacturing Co. .....
Jenkins Sons, Inc., M. W. 133
Jenssen Company, Inc., G. D. .....
Johnson Corporation, The 134
Jones & Sons Company, E. D. ..... 2nd Cover

Kalamazoo Tank & Silo Co. 118
Kamyr Inc. .....

Ladish Co. .....
Langston Co., Samuel M. 74
Layne & Bowler, Inc. 112, 113
Lindsay Wire Weaving Co., The .....
Link-Belt Company 73
Lockport Felt Company 78
Lodding Engineering Corp. .....

Master Builders Co., The .....
Mead Pulp Sales, Inc. .....
Moisture Register Co. 121
Monsanto Chemical Co. .....
Morden Machines Company .....
Murray Mfg. Co., D. J. .....

Nash Engineering Co., The 105
National Aluminate Corp. ..... 1st Cover
National Safety Council .....
Naylor Pipe Company .....
Northwest Engineering Company .....
Norton Company .....

Orr Felt & Blanket Co., The .....

Paper Industry, The 135, 137
Penick & Ford, Ltd., Inc. .....
Photovolt Corporation 141
Poirier Control Company ..... 3rd Cover
Powell Valves 110
Power Stainless Products Co. 128
Pusey & Jones Corp., The 109

Charles P. Raymond Service, Inc. 137
Rogers & Co., Samuel C. 134
Ross Midwest Fulton Corp. .....

Sandy Hill Iron & Brass Works, The .....
Scapa Dryers, Inc. .....
Shuler & Benninghofen 123
Sirrine Company, J. F. 111
Smidth & Co., F. L. 104
Southworth Machine Co. 79
Standard Oil Co. (Indiana) 115
Stickle Steam Specialties Co. 124
Swenson Evaporator Company .....

Taylor-Wharton Co. ..... 4th Cover
Tennessee Corporation .....
Texas Gulf Sulphur Co. 129
Titanium Pigment Corp. 138

Valley Iron Works Company .....
Vanderbilt Co., R. T. 76

Washington Steel Corp. 140
Waterbury Felt Company 137
Webb Company, Jervis B. .....
Weyerhaeuser Timber Co. .....
Whiting Corporation .....
Williams-Gray Company 137

Yarnall-Waring Company .....

Professional & Business Service Section
Calkin & Bayley 136

RES-LIN *wire saver*

SUCTION BOX COVER

offers these features:

1. Even distribution of fabric assures EVEN WEARING.
2. Ends of threads contact wire, assuring uniform surface to wire.
3. Increased wire life.
4. Many years of trouble-free service.
5. Resurfacing reduced to a minimum.
6. Expansion and contraction is reduced to a minimum.
7. Reslin can supply a greater open area without sacrificing strength.
8. Requires no wet storage or care when machine is down.
9. Easily installed.
10. No other can offer as even-wearing and wax-like surface as Reslin.

CANADIAN MANUFACTURING LICENCEE
Joseph Robb & Co.
5575 Cote St. Paul Rd.
Montreal 20, Quebec

MIDDLE-WEST REPRESENTATIVE
Frank Holloin
720 N. Rankin St.
Appleton, Wis.

NEW ENGLAND & NORTH ATLANTIC REPRESENTATIVE
George Clayton
1222 Linwood Ave.
Norristown, Penn.
Norristown, Pa.

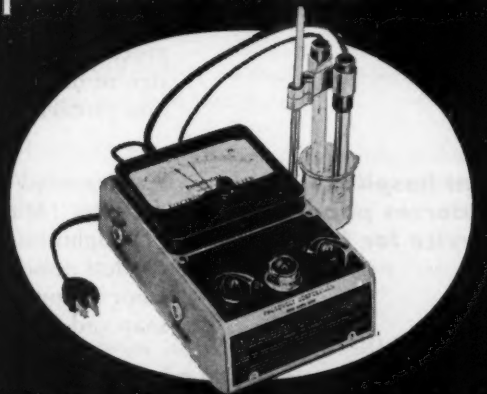
SOUTHERN REPRESENTATIVE
Horace Hill
Rt. 7 — Box 926
Pensacola, Fla.

PROVEN BY TEST

Write for Further Information and Sample of Material

APPLETON WOOD PRODUCTS CO.
APPLETON, WIS.

PHOTOVOLT
pH Meter MOD. 115



A full-fledged line-operated pH Meter of remarkable accuracy at the unprecedented price of $130.-

(complete with electrodes)

Write for bulletin #225 to

PHOTOVOLT CORP.
95 MADISON AVE NEW YORK 16, N. Y.

Air-photo techniques insure more efficient and economical logging road location

Road construction costs can be substantially reduced by planning the road network on a township rather than logging chance unit. Since the cost of a township road network for logging operations may amount to anywhere from $100,000 up, it would seem reasonable — on grounds of efficiency and economy — to arrange for a complete air-photo coverage of the township.

The estimated cost for this would be $600. The more easily interpreted air photos for this purpose are those taken in the spring after the snow has disappeared but before the development of deciduous foliage.

Trends in logging operations

In the interest of more efficient logging operations, the trend is toward the use and development of larger pulpwood loading and transportation equipment to handle more units per man-hour.

Mechanical pulpwood harvesters are being tested in the Southeast, and similar equipment will undoubtedly be developed to handle the larger trees of the Northwest.

Paper with a 13-per cent stretch

Clupak paper, manufactured by West Virginia Pulp & Paper Co. on a new $25,000,000 paper machine at Charleston, S. C., is now available in commercial volume. The paper has a 13-per cent stretch and is softer and more flexible than typical kraft paper. Supermarket check-out bags made of Clupak paper have been shown to withstand 20 or more suspension drops (with an average load of groceries) compared with bag failures after 1-2 drops in the case of bags made of conventional kraft paper.

Clupak Inc., which owns the patents on this stretchable paper process, is organized to license paper manufacturers interested in the use of this process. The company will also provide assistance in helping with the design of machinery, the installation of equipment and the solving of production problems.

Flint hospital endorses paper service for food

Plastic-coated, all-paper food service has been satisfactorily introduced in the Flint (Mich.) General Hospital. Among the reported advantages are: (1) Lightness of food trays; (2) the sanitary quality of the paper service; (3) less noise in handling, and (4) a net cost saving of $400 a month due to labor saving, elimination of china and glass replacements and the use of less soap and detergents.

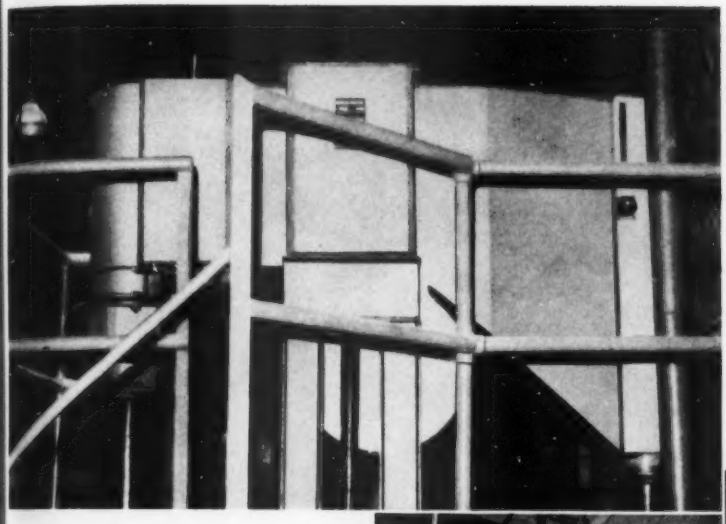
Maintenance should be upgraded

Maintenance is bound to become an increasingly more exacting operation with increased mechanization, electrification and automation of pulp and papermaking processes.

Carefully-engineered maintenance programs will have to be implemented to keep progressively more costly unscheduled down-time to a minimum. This in many cases will necessitate a substantial upgrading of the men in charge of maintenance.

WANT COMPLETE STOCK REGULATION?

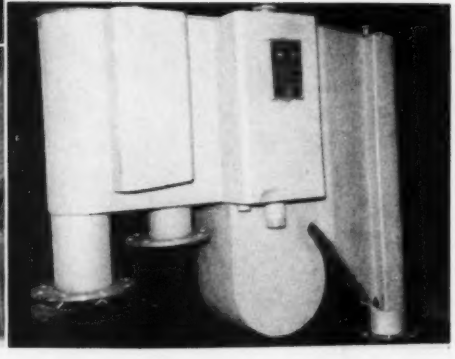
POIRIER COUNTERFLOW CONSISTENCY & BASIS WEIGHT REGULATOR



it regulates VOLUME of stock discharged to maintain BASIS WEIGHT TO WITHIN 2% plus or minus even when stock becomes too light to be controlled by dilution.

THIS MEANS! Incoming consistency can fall below control setting yet the regulator will automatically put on stock to maintain basis weight.

More yardage per run because light chest can be worked off practically down to the last drop.



Volumetric correction means getting on weight fast and holding basis in the face of consistency variation.
After shut-downs no adjustment required even where chest consistency has varied. The regulator automatically discharges the correct net amount of fiber at the new consistency.

THE COUNTERFLOW IS THE ONLY REGULATOR TRULY MAINTENANCE FREE AND INDEPENDENT OF OUTSIDE ATTACHMENTS - FREE FROM ALL MOVING PARTS - INTRICATE LINKAGES AND MOTORIZED MECHANISMS.

CONSISTENCY controlled to within .1% through the use of the Poirier Equilibrium patent — eliminating conventional dilution valves — providing instantaneous, precise correction at stock discharge.

VOLUMETRIC CORRECTION without moving parts through the Poirier patented Multi-Stuff Gate.

THE COUNTERFLOW is used on all regulating problems from the blow pit to the paper machine — Fourdrinier or Cylinder.

Available with 24 hour recording chart — remote controlled stuff gate.

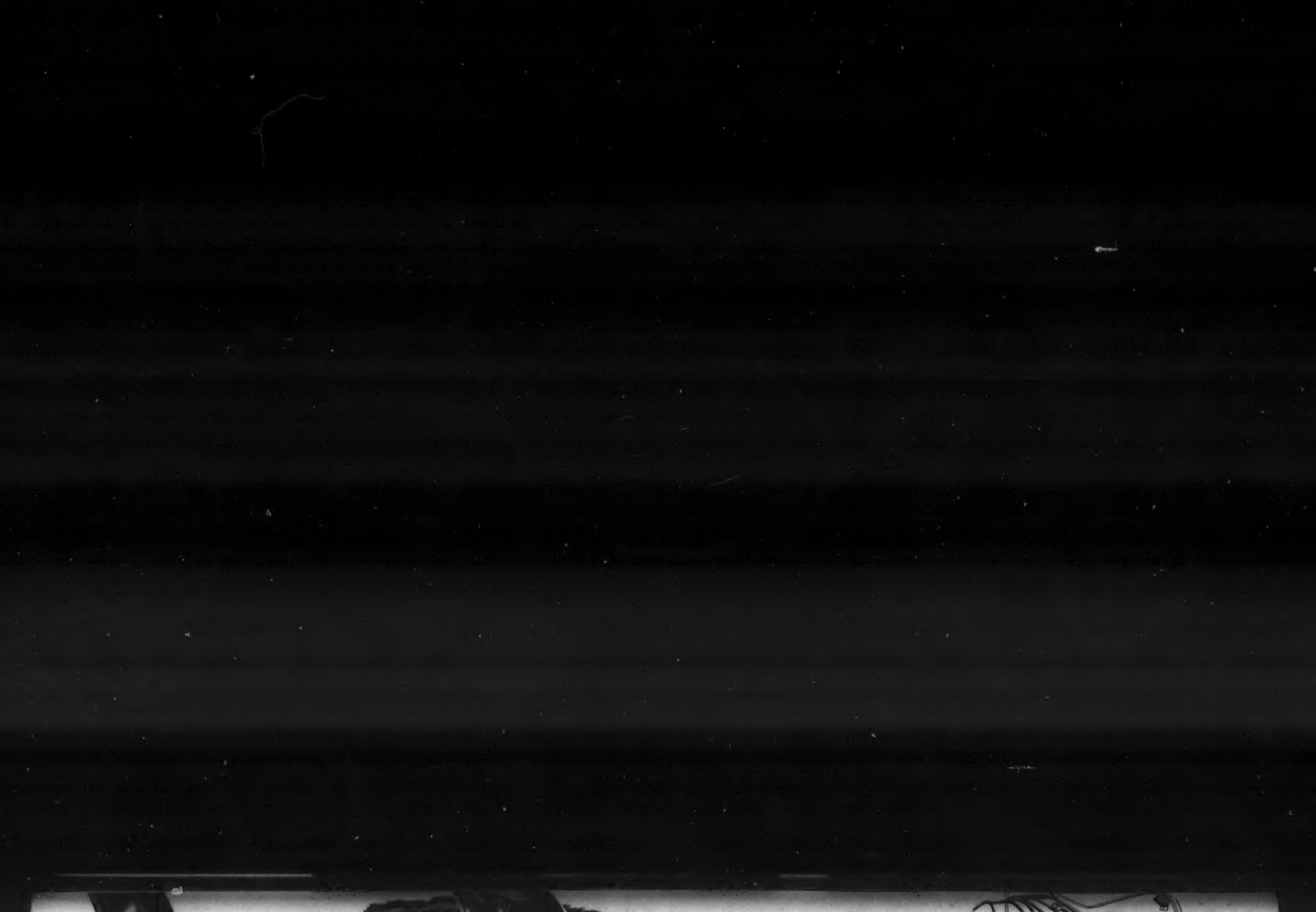
For complete details on how POIRIER GUARANTEED INSTALLATION will solve your stock controlling problems, write to

POIRIER CONTROL COMPANY

SPECIALISTS IN AUTOMATIC PULP STOCK AND VACUUM CONTROLLING EQUIPMENT
WATERVILLE, MAINE

TISCO®
PULP WOOD & BARKING DRUM
CHAIN

Impact, dirt and continuous wear all gang up on pulp wood and barking drum chains, often with costly results. However, tough TISCO manganese steel chains actually get harder through constant pounding, and outwear ordinary chains 5 to 1. Insist on long-lasting TISCO pulp wood chain and barking drum chain for steady, profitable production. To get complete details write to:

TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION
Established 1742
HIGH BRIDGE 5, NEW JERSEY
PLANTS: Cincinnati, O. — Birmingham, Ala. — Easton, Pa.
SALES OFFICES: New York — Chicago — San Francisco